

THE
ANIMAL KINGDOM

ARRANGED IN CONFORMITY WITH ITS
ORGANIZATION,

BY THE BARON CUVIER,

MEMBER OF THE INSTITUTE OF FRANCE, &c. &c. &c.

WITH

ADDITIONAL DESCRIPTION

OF

ALL THE SPECIES HITHERTO NAMED, AND OF
MANY NOT BEFORE NOTICED,

BY

EDWARD GRIFFITH, F.L.S., A.S., &c.
AND OTHERS.

VOLUME THE FOURTH.



No 337

LONDON:

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MDCCCXXVII.



LONDON:
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THE
CLASS MAMMALIA

ARRANGED BY THE

BARON CUVIER,

SPECIFIC DESCRIPTIONS

EDWARD GRIFFITH, F.L.S., A.S., &c.

MAJOR CHARLES HAMILTON SMITH, F.R.S., L.S., &c.

AND

EDWARD PIDGEON, Esq.

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Errata in the Plates.

IN PLATE OF HORNS, &c. OF ANTELOPES.

For Damalis Cuana read Damalis Caana

IN PLATE OF HORNS, &c. OF GOATS AND ANTELOPES.

For Gaz. Mytilopes read Gaz. Subgutturosa
And for Gaz. Subgutta " Gaz. Mytilopes.

Principal Errata in the Order Ruminantia. Vol. IV.

<i>Page</i>	<i>Line</i>					
56	7	for	about	.	read	above.
65	2	"	shape	.	"	stripe.
68	7	"	and branched	.	"	and no branched
74	1	"	it resides	.	"	the species resides
85	last line	"	when they are	.	"	where they are
96	17	"	These horns	.	"	the horns
110	3	"	of the shoulders	.	"	at the shoulders
117	13	"	Jasin	.	"	Sasin
125	19	"	not to return	.	"	but to return
133	11	"	penultimate line, coarser and	.	"	coarse, undulated, a
142	last line, note		Geschichte Braziliens enlaater	.	"	Geschichte Braziliens
147	23	"	Rijang	.	"	Kijang
141	24	"	Amharic	.	"	the Amharic
153	23	"	in the north	.	"	on the north
155	6	"	knots in the web	.	"	meshes in the net
156	21	"	Stresicerotes	.	"	strepsicerotes
156	last line	"	wonderful ease	.	"	wonderful ease
165	13	"	in a feeble	.	"	of a feeble bleeting
168	note, line 4	"	creation	.	"	creature
195	last word in note		Antilope	.	"	Cervicapra
200	26	"	Pygargus	.	"	Pygargus
207	last line note		Begharmu	.	"	Begharmic
208	4	"	Euchon	.	"	Euchore
202	note	"	long ears	.	"	black ears
212	7	"	fulvous gray; brown	.	"	fulvous gray brown
214	23	"	Euchon	.	"	Euchore
221	1	"	Caffrarea	.	"	Caffraria
	3	"	Koosges	.	"	Koosjes.
	19	"	Teshtal	.	"	Peshtal.
233	note	"	Kevenot	.	"	Thyenot
235	25	"	county	.	"	country
237	18	"	larger	.	"	longer.
	30	"	intermediate	.	add	with A. villosa;
	31	"	chain	.	read	species
239	14	"	deemed	.	"	denied
240	6	"		.	delete	below.
	20	"	Vaale-bock	.	read	Vaale-bock
242	31	"	coat	.	"	cost.
243	note	"	animal	.	"	animals.
252	29	"	erets	.	"	frontal crest
258	16	"	want no bushes	.	"	want brushes.
278	22	"	resemble	.	"	resembling.
308	6	"	worns	.	"	horns.
311	8	"	or less elevated	.	"	or less depressed.
313	13	"	is the largest	.	"	are the largest.
	19	"	does not exceed that of	.	delete	that of
	21	"	there are two	.	read	they have two
321	20	"	print by Bassau	.	"	print by Bassau
327	23	"		.	"	half of the tail.
344	11	"	exceptions	.	"	exception.
	17	"	mutilations	.	"	mutations
346	22	"	Nemorhædus	.	"	Nemorhedus.
348	21	"	communicating	.	"	commencing.
349	7	"	legs	.	"	less
354	29	"	thin heavy	.	delete	thin
357	14	"	Guaggas	.	read	Quaggas.
374	25	"	Kobs	.	"	Kuobs

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THE
SEVENTH ORDER
OF THE
M A M M A L I A.

THE RUMINANTIA,

(PECORA. LIN.)

Is perhaps the most natural and best determined of the class, for these animals have the appearance of being almost altogether constructed on the same model, and the camels alone present some small exceptions to the common character.

The first of these characters is the absence of incisive teeth in the upper jaw; in the lower there are almost always eight. In the upper jaw, instead of teeth, there is a callous pad. Between the incisors and the molars is a void space, in which only in a few genera are one or two canines. The cheek-teeth, almost always six on each side in each jaw, have the coronals marked with two double crosses, of which the convexity is turned inward in the upper teeth, and outward in the lower.

The fore-feet are terminated by two toes, and by two hoofs, which face each other by a flat side, so that they have the appearance of a single hoof which had been cleft, whence these animals are said to be bifurcated.

Behind the hoof there are sometimes two small spurs, the only vestiges of lateral toes. The two bands of the metacarpus and metatarsus are united into one.

The name Ruminantia indicates the singular property of these animals, of masticating their aliment a second time which they bring back into the mouth after a first deglutition. This property results from the structure of their stomachs; of these they always have four, the three first of which are so disposed that the food can enter indifferently into either of them, because the œsophagus abuts on the point of communication.

The first and largest is called the *paunch* (*ventriculus*); it receives in abundance the vegetable food, grossly pounded by the first mastication. From this it goes into the second, called the *honeycomb*, or *bonnet* (*reticulum*), the sides of which have laminæ similar to the honeycomb. This stomach is very small and globular; it seizes the food, imbibes and compresses it into little pellets, which afterwards remount successively to the mouth, to be again masticated. The animal remains quiet during this operation, which continues until all the food swallowed before into the paunch has submitted to it. The food, in this manner chewed a second time, descends directly into the third stomach (*omasum*), named *feuillet*, because its sides have longitudinal laminæ like the leaves of a book, and from thence into the fourth (*abomasum*), or *caillette*, the sides of which are in wrinkles, and this is the true organ of diges-

tion, analogous to the simple stomach of common animals. So long as the ruminants live only on their mother's milk, this last is the largest of the stomachs. The paunch does not develop itself, and takes its enormous size only by the reception of the food. The intestinal canal of the ruminants is very long, though but little swelled in the large intestines. Their cæcum is the same, long and smooth. The fat of the ruminants hardens more in cooling than that of other quadrupeds, and becomes even brittle. It is called suet. The mammæ are placed between the thighs.

The ruminants are of all animals those from which man has the greatest advantages. He can eat all of them, and it is from them, in fact, that he derives almost wholly his animal food. Many of them serve as beasts of burden, others are useful for their milk, their fat, their hides, their bones, and other productions.

The two first genera have no horns.

The CAMELS, (CAMELUS, Lin.)

Approximate a little more than the others to the preceding order. They have not only always canines in the two jaws, but moreover two pointed teeth implanted in the incisive bone. The lower incisors six in number, and the cheek-teeth twenty or eighteen only. These attributes, as well as having the scaphoid and cuboid of the tarsus separate, they alone of all the ruminants possess. Instead of

the great hoof, flattened on the internal side, which envelops the whole lower part of each toe, and determines the figure of the ordinary cleft-foot, they have but one small one, which adheres only to the last phalanx, and of a symmetrical form, like the hoofs of the pachydermata. Their swelled and cleft lip, their long neck, their prominent orbits, the weakness of their crupper, the disagreeable proportion of their legs and feet, make them in some degree deformed beings, but their extreme sobriety, and the faculty they have of passing many days without water, render them extremely useful.

This faculty results probably from certain large collections of little cells, with which the sides of the paunch are furnished, and in which water is retained or continually produced. The other ruminants have nothing of the kind.

The camels urinate backward, but they copulate in the ordinary manner, though not without much difficulty. In the rutting season a foetid humour is secreted on the head.

The CAMELS, properly so called,

Have the two toes united underneath, nearly to the point, by a common sole, and the back charged with lumps of grease. They are large animals of the old world, of which two species are known, both entirely subdued to a domestic state *.

* Pallas relates, on the word of the Buchares and Tartars, that there are wild Camels in the Desert of Central Asia; but we must observe that the Calmuks, from a religious principle, give liberty to all sorts of animals.

The Camel with two Bunches, (Camelus Bactrianus, L.) Buff.

XI. XXII.

Originally of Central Asia, and which descends toward the South much less than

The Camel with One Bunch (Camelus Dromedarius, L.) Buff.

XI. XI.

Which is spread from Arabia, in all the north of Africa, and in a great part of Syria, Persia, &c.

The first is the only one used in Turquestan, Thibet, &c. : it is employed as far as near Lake Baïcal. The second is very well known as essential in traversing the desert, and as the only means of communication between the countries which border upon it.

The Camel with two bunches succeeds best in humid soils ; it is larger and stronger than the other. In the moulting time it entirely loses its hair. The Camel with one bunch is the most remarkable for its sobriety ; the *Dromedary* is properly a lighter variety, and more fitted for expedition.

The flesh and the milk of camels serve as food, and their hair for garments of the people who possess them. Both species become almost useless in stony countries.

The LAMAS, (AUCHENIA, Illiger.)

Have two separate toes, and are without humps. Only two distinct species are known, both of the

New World, and much smaller than the two preceding.

The Lama, or, in its wild state, *Guanaco*, (*Camelus Llama*, L.) *Buff. Sup. VI. xxvii.*

As big as a stag, with the fur thick, and of chestnut colour, but which colour varies in domestication. It was the only beast of burden in Peru when that country was conquered. It carries upwards of one hundred and fifty pounds, but is capable only of small journeys.

The Vigogna, or *Paco*, (*Camelus Vicunna*, L.) *Buff. Supp. VI. xxviii.*

About the size of a sheep, covered with yellow wool of admirable fineness and softness, which is made into very valuable stuffs ; it hangs like long silk on the breast.

The MUSKS, (*Moschus*, L.)

Much less anomalous than the camels, differ from the common ruminants only in the absence of horns, in having long canine teeth on each side of the upper jaw, and in having a delicate peronæum, which is not found in the camels. They are delightful animals, as well by their elegance as their agility.

The Musk, (*Moschus Moschiferus*, L.) *Buff. Supp. VI. xxix*

Is the most celebrated species, of the size of a

goat, without a tail. It is entirely covered with hairs, so thick and so brittle, that we may almost call them spines. But that by which it is more especially remarkable is the pouch, situated in front of the prepuce of the male, and which is filled with that odoriferous substance so well known in medicine and perfumery under the name of musk.

This species appears to be proper to that rocky country from which descend the principal part of the rivers of Asia, and which extends between Siberia, China, and Thibet. Its life is nocturnal and solitary, and its timidity extreme. It is at Thibet and Tunkin that it gives the best musk; in the north this substance has scarcely any smell.

The other Musks have no musk-pouch. They all live in the hot countries of the old continent*; they are the smallest and most elegant of all the ruminantia †

All the rest of the ruminants have, at least in the male sex, two horns, that is to say, two prominences of greater or less length of the frontal bones, which is not found in any other family of animals.

In some these prominences are covered with a case of elastic substance, composed like agglutinated hairs, which increase by depositions, and during all the life of the animal; the name of horn is given

* The *Moschus Americanus*, established from Seba, is nothing but the young, or the female of one of the stags of Guiana.

† *Moschus Pygmaeus*, Buff. XII. XLII. *Moschus Memina*, Schreb. CXXLVII. *Moschus Javanicus*, Buff. Supp. VI. xxx.

especially to the substance of this case, and the bony process is called the horn-mould (*corne creuse*). The prominence which the horn envelops increases, like the horn itself, during the life of the animal, and never falls. Such are the horns of the ox, sheep, goat, and antelope.

In others the prominences are enveloped only by a furry skin, which is in continuation of that of the head, and which is not destroyed. These prominences also do not fall off; the Giraffe alone has this kind of horns.

Finally, in the cervine genus, the prominences covered for a time with a skin, furred like that of the rest of the head, have at their base a ring of bony tubercles, which in growing compress and obliterate the feeding-vessels of this skin. It withers and falls off: the bony prominence thus denuded separates, after a certain time, from the cranium to which it was attached: it falls, and the animal remains without horns. But it quickly sends out new ones, in general larger than their predecessors, and destined to undergo the same revolution. These horns, purely bony, and subject to periodical changes, are called antlers.

The STAGS, (CERVUS.)

Are, then, all the ruminants whose head is armed with antlers; but, if we except the Rein-deer, the females are always without them. The substance of these antlers, when it has acquired its

whole development, is a bone very dense, without pores or sinus. Its figure varies considerably according to the species, and even in the same species at different ages. The Stags are excessively rapid, live generally in woods, on grass, leaves, boughs of trees, &c.

The species with horns, either partially or altogether flattened, may be first distinguished, *viz.*,

The Elan, (C. Alces, L.) Elk, or Elend in the north of Europe, *Moose Deer* of the Americans. *Original* of the Canadians. *Buff. Supp. VII. LXXX.*

As big as a horse, and sometimes larger, with high legs, the muzzle cartilaginous and swollen; a sort of goitre or pendulous swelling, variously shaped, under the throat; the fur is always very rough, and of an ash-colour, more or less deep. The antlers of the male, at first simple (*d'abord en dague*), afterwards become ramified; assume, at five years old, the form of a triangular plate, indented on the external edge, and mounted on a pedicle. They increase with age, so as to weigh fifty or sixty pounds, and to have fourteen antlers or indentations to each horn. The Elan inhabits in small troops the marshy forests of the north of the two continents. Its skin is valued for manufacturing purposes.

The Rein-Deer, (C. Tarandus.) Buff. III. xviii. bis.

As large as a stag, but with the legs shorter and thicker. Both sexes have the horns divided

into many branches, at first thin and pointed, but which become by age terminated in enlarged and indented palms. Its fur, brown in summer, becomes white in winter. The Rein-deer inhabits none but the icy countries of the two continents. This is the animal so celebrated for the service the Laplanders derive from it. They keep them in numerous troops, lead them in summer into the mountains of their country, and in winter bring them back to the plains, make them beasts of burden and of draught, eat their flesh, drink their milk, and clothe themselves with their skin.

The Fallow-Deer, (C. Dama, L.) Buff. t. xxvii. xxviii.

Less than our stag, in winter of a blackish-brown, in summer yellow, spotted with white, the buttocks white at all times, bordered on each side with a black stripe, the tail longer than that of the stag, black above, white underneath; the horn of the male is round at the base, with a pointed antler; after a certain age it increases, or becomes, as it were, patched, and divided irregularly into many flat ramifications. This species, which is the *Platiceros*, and not the *Dama* of the ancients, is common in all the countries of Europe; a black variety without spots is sometimes found.

The species with round horns are more numerous; those of temperate climates also change more or less in colour during winter.

The Common Stag, (Cervus Elaphus.) Buff. VL. IX., X., XI.

Yellowish-brown in summer, with a blackish line, and on each side a range of little pale yellow spots along the spine; in winter of an uniform grey-brown; the crupper and tail pale-yellow at all times. It is a native of the forests of Europe, and the temperate parts of Asia. The horn of the male is round, and appears the second year, at first in a simple form, and then takes more branches or antlers as it advances in age, and terminates with a sort of palm, having many small points. When very old they become blackish, and the hair of the neck lengthens, and becomes erect, and it is then that Aristotle calls them *Hippelaphos*. The horn falls in the spring, the old ones losing them first; it returns during summer, and the stags live separately during this time. At that time commences the rutting season, which continues three weeks, and during which the males are almost furious. Both sexes unite in large troops to pass the winter. The hind is pregnant eight months, and brings forth in May; the fawn is yellow, spotted with white. — Stag-hunting, which is considered the noblest of exercises, has become an art which has its theory and an extended terminology, in which the commonest things are expressed by whimsical terms, or perverted from their common acceptation.

The Canadian Stag, (C. Canadensis. Gm. C. Strongyloceros, Schreb. CXLVI. A., CXLVII. F. G.) Elk, or Elan, of the Anglo-Americans.

Larger than ours, of the same colour, with the horns equally round, but more developed, and which never take a flat or palmated form; may probably be only a variety of the common stag. It inhabits all the temperate parts of North America.

The Stag of Louisiana, or Virginia, (C. Virginianus, Gm.) Fallow-deer of the Anglo-Americans. Mazame of Mexico.*

Less than ours, more slender, the muzzle more pointed, bright yellow in summer, reddish-gray in winter, under part of the throat and tail white at all times, the lower third of the tail black, and the end white. The horn of the male round, smooth, and whitish, deviates outward to form a circular arch inward and forward; it never has more than three antlers.

The species of the warm countries do not change their colour.

The Indian Stag, or Axis. (Cervus Axis, Lin.) Buff. XI. XXXVIII. XXXIX.

Yellow at all times, spotted with pure white, the under part of the throat and tail white; tail yellow, bordered with white on the upper side;

* The *Cariacou*, Daub. XII. XLVI. is its female.

the horns are round, and become very large with age, but never have more than one antler toward the base, and the point forked. Originally of Bengal, but propagates easily in all countries. The species with little horns are called Roebucks.

The Roebuck of Europe, (Cervus Capreolus, Lin.) Buff. VI.

XXXII. XXXIII.

Yellow-gray, with white haunches, without lachrymal sinus, almost tailless; the horns of the male short, erect, forked at the extremity, with an antler in front of the trunk of the horn. There are some individuals bright-red and others blackish. This species lives in couples in the elevated forests of the temperate parts of Europe; loses its horns at the end of autumn, reproduces them during winter, enters into heat in November, and is gravid nine months and a half. The flesh is much more esteemed than that of the stag. There are none in Russia.

The Roebuck of Tartary, (C. Pygargus, Pal.) Schreb. ccliii.

Similar to ours, but with the horns more prickly at the base; the hair longer; nearly of the size of a deer. It inhabits the elevated countries on the other side of the Volga.

The Roebuck of India, (Cerv. Muntjac, Gm.) Buff. Supp.

VII. xxvi.

Smaller than ours, with a tail, lachrymal sinuses,

small canine teeth like the stag, and the horns deeply cleft, but elevated on long prominences of the frontal bone, between which is a plaited elastic and unctuous skin. It lives in small troops, in Ceylon and Java. Its fur, white at the base, brown at the point, has hence a grayish tint.

America also produces different species of the Roebuck, but which have been hitherto but ill defined. As these are all of the warm parts of this country, they do not change their colour, and have no fixed periods for changing their horns.

Some have the horns arched, with as many as five antlers, according to their age, while others have them always in form of a dagger*.

The GIRAFFE, (*CAMELOPARDALIS*, *Lin.*) *Buff. Supp. VII.*

LXXXI.

Has for its character in both sexes conical horns, always covered with a furry skin, and which never fall. It is moreover one of the most remarkable of animals by the length of its neck, the disproportion-

* The Roebuck of America, *Buff. VI. Pl. xxxvii.*, has the horns large, short, arched, with five very tuberculous antlers toward their base. If this, as it appears to be, is the *Gouazou Poucou* of D'Azara, it must be as big as our stag, of a reddish colour, with the upper part of the tail and end of the feet black, inhabiting humid places. It is its horns which Pennant represents under the name of *Cervus Mexicanus*. The *Gouazou Pita* which we have in the Museum, is smaller than a Roebuck, of a bright marron-red, with white at the end of the lower jaw. We have moreover seen two heads with simple or dagger-shaped horns; yellow-gray; one of the size of the deer, the other of the roebuck. This is called *Cariacou*, at *Cayenne*.

tionate height of its fore-legs, and by a bony tubercle which it has upon the forehead.

Only one species is known (*Camelopardalis Giraffe*, L.) confined in the deserts of Africa, with short gray hairs, sprinkled with irregular yellow spots, with a slight main, gray and yellow, which passes from the ears to the crupper. It is the tallest of all animals, for its head attains eighteen feet in height. It is of a gentle disposition, and lives on the leaves of trees. The Romans had living Giraffes at their games.

THE RUMINANTS WITH HOLLOW HORNS

Are more numerous than the others, and it has been necessary to divide them into genera, from characters of slight importance, drawn from the form of the horns, and the proportions of their different parts.

M. Geoffroy has advantageously joined to these those which give the substance of the frontal prominence or bony nuts of the horn.

The ANTELOPES (ANTILOPE).*

Have the substance of their bony nut solid, and without pores or sinews like the horns of stags. They resemble, moreover, the stags by the lachrymal sinuses, by their lightness and swiftness. It is a very numerous genus, which has been necessarily subdi-

* This name is not ancient ; it is corrupted from *Antholopos*, found in Eustathius, an author of the time of Constantine. The common gazelle has been well described by Ælian, under the name of *Dorcas*, which is probably that of the roebuck. Gazel is Arabic.

vided, principally according to the form of the horns.

a. Horns annulated with double or triple flexures, points forward or inward, or vertical.

The Gazelle. (Ant. Dorcas, Lin.) Buff. XII. xii.

With the horns round, thick, and black; with the elegant make of the roebuck; light yellow above, white underneath; a brown band along each flank; a bunch of hairs on each knee; a deep pouch at each groin.

It lives in all the north of Africa in countless troops, which form a circle when they are attacked, and present their horns in every direction. It is the common repast of the lion and panther. The gentleness of its appearance furnishes numerous images for the amorous poetry of the Arabs.

The Corinne. (Ant. Corinna, Gm.) Buff. XII. xxvi.

Differs from the last only in having the horns much more slender. It is, perhaps, only a variety.

The Kevel. (Ant. Kevella, Gm.) Buff. XII. xxvi.

Is again very similar, but the horns are compressed at their base, and have more rings. It is pretended that this differs from the *Ahu* of Kæmpfer, or the *Treyzain* of the Persians and Turks, (*Ant. Subgutturosa, Gm.*), because a

slight swelling has been observed under the throat and chin.

The Dseren of the Mongoles. Hoang-yang, or Yellow Goat of China (Ant. Gutturosa. Pall.), Schreb. cclxxv.

Presents again almost the same distribution of colours and the same horns as the Gazelle, properly so named, but in size it approaches the Deer, and the male has a strong protuberance produced by the larynx, and a large pouch under the belly. The female has no horns. This species lives in troops in the dry plain of central Asia, and avoids both water and the forest.

The Springbock, or Pouched Gazelle (Ant. Euchore. Forst.), Buff. Supp. VI. pl. xxi.

Numerous herds of this species fill the south of Africa; it is larger than the Gazelle, but of the same make and colour; and distinguished by a fold of the skin of the croup, furnished with white hairs, which opens and enlarges at every leap made by the animal.

The Saiga (Ant. Saiga. Pall.) Colus of Strabo. Schreb

cclxxxv.

Inhabits Hungary and the south of Poland and Russia, it has the horns of the Gazelle, but they are yellowish and transparent. It is as large as a deer. Its fur yellow in summer becomes

whitish gray in winter. Its cartilaginous, thick, and swelled muzzle, with very open nostrils, obliges it to feed in retrograding. The species sometimes unite in herds of ten thousand.

The Antelope of India (Ant. Cervicapra, Pall.), Buff. Supp. VI. xviii. xix.

Is also very similar to the Gazelle, but its horns have a triple flexure. They make offensive weapons of them in India by uniting two with the points opposed. The female is without horns*.

- b. Horns annulated with a double bend, but contrariwise to the preceding subdivision, and the point backward.

The Bubalis of the Ancients (Ant. Bubalis, Lin.), vulgarly the Barbary Cow. Buff. Supp. VI. xiv.

With heavier proportions than the other species, the head long and thick, of the size of a stag, with yellow fur, except the end of the tail, which is terminated by a black tuft. Common in Barbary.

The Caama. (Ant. Caama, Cuv.) The Cape Stag of the Hollanders. Buff. Supp. VI. pl. xv.

Similar to the preceding, but with the curves

* To this subdivision also belongs the *Purple Antelope*. (*Ant. Pygarga*.) Schr. cclxxxiii., and the *Boba*, (*Ant. Senegalensis*), the horns only of which are known, *Buff. XII. pl. xxxii. 2*, unless it be the same as the *Pallah* of S. Daniels, *African Scenery*, pl. ix., which much resembles the Gazelle, but is larger.

of the horns more angular; a space round the base, a band on the bottom of the forehead, a line on the neck, a longitudinal band on each leg, and the end of the tail black. Common at the Cape.

c. Horns annulated, straight, or little bent.

The Oryx (*Ant. Oryx*, *Pall.*), ill-named *Pasan* by Buffon. *Supp. VI. pl. xvii.* *Cape Chamois* of the Hollanders.

Size of a stag, with slender horns, two* or three feet long, straight, pointed, round, annulated obliquely at the lower third, smaller in the female; fur ashy, head white, barred with black; a black band on the spine, and one on each flank; a deep brown spot on the shoulders, and one on the thigh. The tail long and blackish, and the fur of the spine directed toward the neck. This singular animal is the *Oryx* of *Ælian*, and it is from an individual which had lost one horn that the idea first originated of the Unicorn, so celebrated by the discussions it has occasioned. It is found to the north of the Cape and in the interior of Africa. Its hoofs longer than in the other species facilitate its climbing rocks, and it frequents mountainous countries by preference*.

* The *Ant. Leucorix*, Schreb, cclvi. B, and *Ant. Gazelle*, appear to be only varieties of the *Oryx*; but the *Klip-springer*, (*Ant. Oreotragus*.) *Buff. Sup. VI. pl. xvii.*, the *Grim*, (*Ant. Grimmia*). id. ib. *III. pl. xiv.*

- d. Horns annulated with a simple bend, the point backward.

The Blue Antelope (*Ant. Leucophaea*, Gm.). Commonly called the Blue Goat, ill-named *Tseiran*. *Buff. Supp. VI. pl. xx.*

Rather larger than the Stag, of a bluish ash colour, the horns large in both sexes, uniformly bent, and with more than twenty annuli.

The Equine Antelope (*Ant. Equina*, Geoff.)

As large as a horse, reddish gray, head brown a white spot before each eye, a mane on the neck, &c.

- e. Horns annulated with a simple bend, the points forward.

The Nanguer (*Ant. Dama*, Lin.), probably the *Dama* of Pliny, *Buff. XII. pl. xxxiv.*

As big as a roebuck, yellow, the neck, the under part of the body and the hind part white. From Senegal*.

- f. Horns with spiral ridges.

and the *Guvey*, (*Ant. Pygmaea*), have short horns, so little bent that they might be referred to this section. The *Duiker*, or *Plunging Goat of the Cape*, which Allamand confounded with the *Grimme* and the *Ourebi*, (*Ant. Scoparia*), Schreb. cclvi. appear to be nearly allied to them.

* To this subdivision belongs the *Nago*, (*Ant. Redunca*, *Buff. XII. pl. xlvii.* The *Riet-reebock*, or *Reed Antelope*, (*Ant. Ecleotragus*), Schreb. Schr. cclxvi. (*Ant. Arundinacea*, Shaw.) *Buff. Supp. VI. pl.*

The Canna (*Ant. Oreas. Pall.*). *Cape Elk* of the Hollanders. Named improperly *Coudous* by *Buff. Supp. VI., pl. XII.*

As large as the strongest horse, with thick straight conical horns, surrounded with a spiral ridge; fur grayish, a slight mane along the spine, a sort of dew lap under the neck, the tail terminated by a tuft. It lives in troops in the mountains north of the Cape*.

The Coudous (*Ant. Strepciseros, Pall.*), improperly named *Condoma* by *Buff. Supp. VI. pl. XIII.*

As large as a stag, gray brown, striped across with white; large horns in the male only, smooth, with a triple bend, and a single longitudinal ridge slightly spiral; a little beard under the chin, a mane along the spine. Lives insulatedly northward of the Cape.

g. With smooth horns.

The Nylgäu (*Ant. Picta et Trago Camelus*), *Buff. Supp. VI. pl. x. and xi.*

As large or larger than a stag, the horns short,

xxiii. and xxiv. This species is probably the same as the *Kob*, (*Int. Kob*.) of which the horns only are known. *Buff. XII. pl. xxxii. f. 1.* The *Griesbock*, the *Steinbock*, and the *Beckbock* of Forster, *Buff. Supp. VI. p. 186*, should also belong to it.

* Near to the *Canna* ought to be placed the *Guib*, (*Ant. Scripta.*) *Buff. XII, pl. xl.*; the *Bosch-bock* (*Ant. Sylvatica.*) *Buff. Supp. VI. xxv.*

bent forward, a beard under the middle of the throat, the fur grayish, black and white rings on the feet; the female without horns. This species belongs to India.

*The Chamois (Ant. Rupicapra, L.), Buff. XII. pl. xvi.
Ysard of the Pyrenees.*

The only ruminant in the west of Europe that can be compared with the Antelope; has, nevertheless, particular characters; its straight horns are suddenly bent backward, like a hook; behind each ear, under the skin, is a sac, which opens outwardly by a little orifice. The size of the Chamois is that of a large goat. It has the fur deep brown, with a black band descending from the eye toward the muzzle. It runs with the greatest agility among steep rocks, and continues in small troops in the middle regions of the highest mountains.

*The Gnou, or Niou (Ant. Gnu. Gm.), Buff. Supp. VI. pl.
viii. and ix.*

Differs still more than the Chamois from the Common Antelope, and seems, even at first view, a monster composed of parts of different animals. It has the body and crupper of a small horse, covered with brown fur; the tail is furnished with long white hairs, like that of a horse, and on the neck is a handsome straight

mane, white at the bottom, and black at the end of the hairs. The horns approximated and enlarged at their base, like that of the Buffalo of the Cape, descend outwardly, and turn up at the point. The muzzle is large, flat, and surrounded with a circle of projecting hairs; under the throat and dewlap is a second black mane. The feet have all the lightness of those of the Stag. Both sexes have horns.

This animal lives in the mountains northward of the Cape, where it appears to be very rare,—the ancients, nevertheless, had some knowledge of it*.

The three remaining genera have the bony core of their horns occupied principally by little cells, which communicate with the frontal sinus. The direction of their horns has furnished the characters for their division.

The GOATS (CAPRA, L.),

Have the horns directed upward and backward. Their chin is generally furnished with a long beard, and their forehead concave.

The Ægagre, or Wild Goat, (Capra Ægagrus, Gm.) Cuv. *Menag. du Mus.* in 8vo., II. 177.

Which appears to be the stock of all the varie-

* It is probably this animal which has given occasion for their *Catoblepus*. See Pliny, lib. VII. c. xxxvi. and Ælian, lib. VI. c. v.

ties of our domestic goats, is distinguished by its horns, edged in front, very large in the male; short, and occasionally none, in the female, which is sometimes the case in the two species of Ibex. It inhabits the mountains of Persia gregariously, where it is known under the name of *Paseng*, and perhaps also the mountains of many other countries, even the Alps. The oriental bezoar is a concretion found in its intestines.

The Goat and the domestic species (*Capra Hircus*) vary infinitely in size, colour, the length and fineness of the fur, size and number of horns. The Angora Goats in Cappadocia have the longest and most silky fur. The goats of Guinea, called Mambrines, and Whida, are very small, and have the horns reclining backwards. All these animals are robust, capricious, wandering, feeling their mountainous origin, preferring dry and wild places, and living on coarse grass and the shoots of young trees. They are very injurious to the forests. Scarcely any but the kids are eaten, but their milk is useful in many diseases. The female can produce at seven months, her gestation is five months, and she generally has two at a birth. The male can propagate at a year old; one will suffice for more than one hundred females; he is old at five or six years.

The Bouquetin, or Ibex (Capra Ibex, L.), Buff. XII. pl. XLII.

Has large horns, square in front, and marked

with prominent transverse knots. It inhabits the most elevated summits of the highest chains of mountains of the whole ancient continent.

The Caucasian Iber (Capra Caucasica), Guldenst. Act. Petrop. 1779. II. pl. xvi. xvii.

Is distinguished by large triangular horns, obtuse, but not square in front, knotty like those of the preceding. The two species mix with the Domestic Goat*.

The SHEEP (Ovis),

Have the horns directed backward, and returning spirally, more or less in front; their forehead is generally convex, and they are without a beard. They so little merit being separated generically from the goats, that they produce a prolific mongrel breed. As in the Goats, there are several races or wild species very nearly approximated.

The Argali of Siberia (Ov. Ammon, L.), Pall. Spic. XI. 1.

The male of which has very thick horns, with the base triangular, rounded at the angles, flattened in front, striped across; and the female with the horns compressed, and in form of a

* Add. The maned Bouquetin of Africa. Takaitre of S. Daniel's African Scenery, pl. xxiv.

scythe. Its summer fur is short yellowish-gray; the winter fur is thick, hard, reddish-gray, with white, or whitish, on the muzzle, throat, and under the belly. There is at all times, as in the Stag, a yellowish space round the tail, which is very short. This animal inhabits the mountains of all Asia, and becomes as large as a fallow deer.

The Mufflon, or Mufione of Sardinia, Muffoli of Corsica,
Buff. XI. pl. xxix.

Differs from it in not being so large, and the female is without horns, or, if with them, very small. It is said to be found also in Crete. There are varieties, partially or altogether black, and others more or less white.

There is reason to think that

The Mouflon of America (Ov. Montana), Geoff. An. Mus.
II. pl. lx. Schreb. ccxiv. D.

Is a species of Argali, which has been able to pass the sea on the ice. Its horns are very thick, and are more completely spiral than in the common species.

The Mouflon of Africa (Ov. Tragelaphus, Cuv.), Pen. No.
XII. Shaw. pl. ccii. 2.

With the fur soft and reddish, with a long pendant mane under the neck, and another at each

wrist ; the tail short ; appears to be a distinct species. It inhabits the rocky countries of the whole of Barbary, and M. Geoffroy has observed it in Egypt.

It is from the Mouflon, or the Argali, that we are supposed to derive the numerous races of our woolly animals, which, next to the Dog, seem most subject to vary.

We have them in Europe with common wool, in size large or small ; with horns, large or small, without horns in the female, and in both sexes without. The most interesting varieties are those of Spain, with fine crisp wool, large spiral horns in the male, and of England with fine and long wool. A variety begins to spread throughout Europe.

The most extended variety in southern Russia has a very long tail ; those of India and of Guinea, which also have the tail long, are distinguished by their long legs, convex forehead, pendant ears, and by the absence of horns and short wool. The north of Europe and of Asia has almost everywhere small sheep, with a very short tail.

The race of Persia, Tartary, and China, has the tail entirely transformed into a double globe of fat, that of Syria and Barbary has it, in truth, long, but also charged with a suety mass of fat. In both, the ears are pendant ; the horns thick in the rams, moderate in the other sex and in the lambs, and the wool mixed with fur.

Sheep are everywhere valuable for the flesh, suet,

milk, skin, fur, and dung ; their flocks, well managed, carry fertility everywhere.

Lambs are weaned at two months old, are castrated at six, and change their milk-teeth between one and three years old. The young can procreate at a year, and produce till ten or twelve ; gestation continues five months ; they bring two young at a time. The ram arrives at puberty in eighteen months ; and suffices for thirty females. They are fatted when about eight years old.

The Ox (Bos, Lin.),

Has the horns directed sideways, turning upward or forward, in form of a crescent ; they are more over large animals, with a large muzzle, low structure and stout legs.

The Common Ox (Bos Taurus, L.), Buff. IV. xiv.

Has for its specific character a flat forehead, rather long than large, and round horns, placed at the two extremities of a ridge which separates the forehead from the occiput. In the fossil crania which appear to have belonged to this species in a wild state, these horns bend forward, and toward the base ; but in the countless domestic varieties they have very different directions and sizes, and are sometimes altogether wanting. The common races of the torrid zone have all a lump of fat on the shoulders, and there are some among the num-

ber which are scarcely bigger than the hog. All the world knows the utility of these animals for labour, for their flesh, fat, hides, and milk; their horn even is employed for useful purposes.

The cow is gravid nine months, and can breed at eighteen, the bull at two years. The male is mutilated at eighteen months or two years old, and is fattened at ten.

The Aurochs of the Germans, Zubr of the Polanders (Bos Urus, Gm.), Urus, or Bison of the ancients, Gesn. CLVII.

Passes generally, but improperly, for the wild stock of the horned cattle. It is distinguished from them by its prominent forehead, rather large than high, by the attachment of the horns below the occipital crest, by the height of its legs, by an additional pair of ribs, and by its grunting voice. It is a fierce animal, confined at present to the great marshy forests of Lithuania, of the Krapacs, and of Caucasus, but which formerly inhabited the whole of the temperate parts of Europe. It is the largest quadruped, after the Rhinoceros.

The Bison of America, Buffalo of the Anglo-Americans (Bos Bison, L. Bos Americanus, Gm.), Buff. Supp. III. v.

Has not hitherto been sufficiently compared with the *Aurochs*. Its legs and tail appear shorter, the fur of its head and beard longer,

&c. It inhabits the whole of the temperate parts of South America.

The Buffalo (*Bos Bubalus*, Lin.), Buff. XI. xxv.

Originally of India, and brought into Egypt, Greece, and Italy during the middle ages, but unknown to the ancients; with the forehead convex, more long than large, the horns directed sideways, and marked in front with a longitudinal ridge. It is a difficult animal to subdue; it has great power, and prefers marshy places and coarse plants, which the ox cannot live on. Its milk is good; its hide very strong, but its flesh is little esteemed.

There is a race of them in India with the horns opening ten feet; it is colled *Arni* in Hindustan, and is the *Bos Arni* of Shaw.

The Yack (*Bos Grunniens*, Pall.), *Buffalo* with horse's tail. *Grunting Cow* of Tartary, Schreb. ccxciv. A. B.

Is a small species, with the tail entirely furnished with long hairs, like that of the horse, and with a long mane on the back; its head appears to resemble that of the Buffalo, but its horns are not hitherto sufficiently described. This animal, of which Ælian has spoken, is originally of the mountains of Thibet. It is with its tail that the standards still in use among the Turks were first made, to distinguish the superior officers.

The Cape Buffalo (Bos Caffer, Sparm.), Schreb. ccc1.

Has very large horns, directed sideways and upwards, remounting at the point, flat, and so large at their base that they nearly cover all the forehead, leaving between them only a triangular space, the point of which is upward. It is a very large animal, extremely ferocious; inhabits the woods of Caffraria.

The Musk Ox of America (Bos Moschatus, Gm.), Schreb. ccc11. The Head, Buff. Supp. VI. 111.

Has the horns close, and directed like the preceding, but meeting on the forehead by a right line; the female has them smaller and separated. It is low on the legs, covered with a tufted fur which hangs to the ground. Its tail is extremely short; it emits more powerfully the musky odour common to all the genus. It is only seen in the coldest parts of North America, but it appears that its skull and its bones have sometimes been carried by the ice to Siberia. The Esquimaux make bonnets of the tail, the fur of which falling on their visage defends them from the musquitoes.

SUPPLEMENT TO THE ORDER RUMINANTIA.

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IN reviewing the Ruminantia, it appears necessary to extend the observations on their character and structure, somewhat beyond the strict outline which Baron Cuvier has furnished, in the definitions of this order. For this purpose we shall combine a few extracts from the works of comparative anatomists of this country, on the internal structure of the animals in question, with some remarks taken from our author's able work on fossil bones, so as to supply a more distinct conception of the final causes for which they were created, and by which they exist.

Ruminating animals, in common with most quadrupeds, have the legs shorter in proportion to the length of the trunk, and their spines more flexible than man; by means of this formation, their progressive motion is facilitated, and their food attained with ease. In most species the epiglottis covers the rima entirely, having no apparent uvula, but a gland secreting mucus to lubricate the food, and to act at the same time as a valve to prevent the substance swallowed from returning into the mouth, while the animal feeds, which is mostly with the head downwards: this gland is placed on the upper part of the pharynx behind the cricoid cartilage. In the skull the parietal bones form but one, assuming the shape of a belt, behind and above the frontals; these are very long, and form a powerful arch over the orbits to secure the eyes, and give a firm seat to the roots of the horns.

By the length of the nose and the convolute surface on which the Schneidarian membrane is stretched, ruminants are endowed with an acute sense of smelling, necessary for the nice selection of their food, in the choice of which the preference is so predisposed, that while nearly all the genera and species will feed on the most common plants, each have some particularly grateful or harmless to them, so that scarce any exist that are not adapted to this special end of subserviency to animated nature. Their ears are placed far back and very moveable, the most advantageous position for hearing behind the animal while feeding, because at that moment it is most exposed to unseen danger, the attention and eyes being engaged in a great measure before it: the pupil of the eyes, in the whole order, is invariably of an oblong form, enabling them to take a more extensive horizontal range of vision without turning the head or lifting it from their food. The eye is furnished with a nictitating membrane stretching from the inner canthus to nearly half over the ball, thus protecting those organs from danger while in search of their food. In common with other quadrupeds, they possess a seventh muscle of the eye, called suspensorius, fixed in the sclerotic coat, and intended to sustain the weight of the orb, and to prevent the optic nerve being stretched; the posterior part of the cricoid coat, called the tapetum, is, in them, generally of a green passing into a blue colour, to enable them to see their food the better, and facilitate vision in the dark.

To the strength of their skulls, already noticed, are added in most species, osseous prolongations from the forehead, forming either sessile antlered horns, or bony cores, upon which the horny covers vaginate and construct true horns: these serve for defence, and for conquest among themselves in the strife for females, it being intended by nature that the most powerful should chiefly procreate the breed, and thus transmit the character of the species in full vigour to posterity.

The neck is in general lengthened, so as in conjunction with the maxillæ, which are also long, to reach their food with greater ease. The spinous processes of the vertebræ of the neck diminish in proportion to its length. The ribs are broad and thick. The tuberosity near the head of the humerus or thigh-bone of the atlantal extremity, and the rough edge of the bone, give greater space for the insertion of strong muscles; and the two bones of the fore-leg, (radius and cubitus,) nearly grown together, give great firmness to the anterior limbs, facilitate forward movement, and prevent nearly all lateral motion; the toes, externally appearing as two only, are in number the same as in other animals, though all are not equally developed.

The haunch-bone is shaped like a hammer, with the anterior part of the spine extremely large, furnishing room for broad and strong muscles, for the same purpose as in the atlantal, and for defence, by adding great force in kicking; the extremities collectively being admirably adapted to sustain the heavy mass which constitutes the trunk.

As there is in the text of the Animal Kingdom a full detail of the four stomachs which the animals of this order possess, we shall only subjoin that, by their united action, the food is so completely digested, and converted into chyle, that they can subsist, in proportion, upon a much smaller quantity than horses or asses, whose organization not being the same, void theirs very little altered, and, consequently, want a greater quantity: hence also their dung is less useful as manure than that of horses.

The season of copulation is periodical in all the species of this order; and announces itself after the period when their food has been most abundant, when the horns of some genera have been reproduced; of others, when their bony core has received its increase, and the horny sheath prolonged by additional ringlets at the bottom; when, in the hornless species, a fetid humour is distilled from orifices in

the back of the head, the pouch near the prepuce is filled with musky matter, or discharges take place at the nose; secretions which perhaps carry off the superabundance of a fluid, which, under other combinations, is productive of the osseous increase of the horns in some, or of their regeneration in others: when these symptoms, singly or collectively, have appeared in the males, they become more restless and bolder than before, they use their voice, and are pugnacious. With the females gestation is so arranged by the unerring law of nature, that parturition does not come on until renovated verdure supplies ample means of subsistence, and of concealment of their offspring; then in their turn, they become bold, daring and sagacious, until their young are able in a great measure to shift for themselves.

Of the instinctive faculties and intelligence of ruminating animals, we shall speak under the heads of their respective genera, excepting inasmuch as their faculties are operative collectively, and between one genus and another. Although we know but little of these qualities in animals, the most obvious species of which are degenerated in this particular, by the interventional care of man; yet we may infer, that even those degraded creatures, unused as they are to exercise their instinct, have the means of communicating not only the wants of one individual of a species to another, but also of one genus to another. The following fact, which happened before our eyes, may serve as a proof of this opinion:—

During an afternoon walk with a friend on a hill near Coventry, we observed several sheep standing with steadfast looks round the head of a cow which was grazing: their fixed attitude attracted our attention, and as we came up, the Cow suddenly raised her head, and the Sheep opened before her, as we imagined, to go out of our way; she did not, however, proceed more than a dozen yards, before she reached a gravid Ewe, which, hitherto unnoticed

by us, had fallen over on her back, and was unable to recover herself from that perilous position. The Cow placed the tip of her horns close under the side of the animal, and gave a slight toss, so dexterously managed, as to enable the Ewe to get instantly on her feet; meantime the other sheep had dispersed, and the two animals walked their way.

The Camels. (Camelus, Linn.)

The name by which these animals are generally known in Europe, is evidently derived from an eastern root—Djemel of the Arabs, Gamel or Gimal of the Hebrews, and points out the quarter where they have been domesticated from a period anterior to all historical documents. In the systematic arrangements of the ruminating order, authors place them at the head of the series, because they possess exclusively some characters, which indicate still an affinity with the Pachydermous families, and others which are strictly their own. Among the former are the anomalous character of the teeth, a thick hide, and the horny soles of their feet; among the latter, that additional pouch or large fold in the paunch, serving as a reservoir for water, and the structure of the urinary apparatus, which renders them *retromingent*: but the presence or absence of the hunch or hunches on the back, and the callosities on the sternum and joints may be questioned, some eminent naturalists having even asserted, that they were not natural but accidental characters, the result of long subjection and absolute slavery.

Notwithstanding the assertion of the Negroes, that camels in a wild state are still to be found in the mountains of Central Africa, and of others, that an unreclaimed species exists in the country of the Calmucks; it may be doubted whether they be other than strayed or emancipated individuals*.

* According to M. Desmoulins, the Camel existed in a wild state in Arabia in the time of Artemidorus, or the period of Hadrian.

We can therefore only view them as they exist in a domestic character, and as such they must be regarded as one of the most important conquests of man over the brute creation. Nor can we consider the victory thus obtained as the result of force alone, when the stature and power of the animal, the obstinacy and fierceness with which he resists ill treatment in his present condition, be taken into account; much, nay most, should be ascribed to a confident nature in the creature and persevering gentleness in man.

The teeth of the Camel offer molars possessed of the general character of the Ruminantia, but they do not present a continuous series in the upper maxilla; the foremost, in the shape of a crook, being separated from the others, and placed midway in the diastema, or interval in the mouth, between the molars and the incisors. Before these are two strong canines, and what is more singular, instead of a total absence of incisors in the upper jaw, as obtains in all other ruminants, two corresponding to the lateral ones appear, and have likewise the form of canines; so that the animal shews three of them on each side of the upper maxilla. Below, the two external incisors assume a corresponding pointed form, and insert themselves between the upper incisor and the canine behind it; and the foremost of the molars, particularly in old animals, growing likewise in the diastema, with the forms of a canine, reduces the true grinders to five, and offers two of these pointed crooked canines on each side of that jaw.

The feet are divided into two toes without being separated, for a horny sole spreads from the heel forwards under the foot, uniting the middle part, and leaving the toes only free; these are protected by a short ungicular nail.

If to these distinctions we add the callosities of the sternum, and two on the joints of each leg, the linear form of the nostrils, the division of the upper lip, and the

hunches on the back, we have nearly all the external character of the Camel; but exclusive of these, its body is large, neck long and bent, ears short, eyes prominent and dull, and legs disproportioned, long, and meagre; exhibiting altogether an assemblage so ugly and stupid, that it requires all the partiality of Arabian eyes to perceive the propriety of that image in their poetry, which compares a young bride in her nuptial attire as "moving gracefully like a young camel." These apparent disproportions are however in reality only manifestations of that great will, which adapts everything with wonderful precision to its destined end: for in the hands of nature true disproportion is nowhere to be found; and although we cannot at all times point out the direct motive for given characters, yet in the case before us several may be assigned with confidence.

Thus the particular structure of the teeth indicate a predilection for food not obtained by grazing, but by browsing on shrubs, leaves, and branches, which require the action of powerful means to tear down and masticate; and although in Europe, or where fodder is plentifully served, the animal will pick with care the very best, we know that, in his native regions, he feeds on bitter artemisia, thistles, mimosas, and other thorny trees and shrubs, such as the guwasse, &c. For this particular purpose he is furnished with a divided upper lip, each separately moveable and slightly extensile; which he uses like palpi to feel, examine, touch, and to turn the substances into the mouth with great dexterity.

The nostrils having the form of slits, open and close at the will of the animal, and are admirably adapted to inhale the air, and exclude the acrid dust of the sandy deserts. To enable him to move with facility on a soft and sinking surface, his feet are broad and cushion-shaped, and his limbs long and elevated: he picks the thorny

bushes as he passes along without halting ; and provided with the extraordinary apparatus in the ventriculus to carry water, he resists the burning heat for ten or even twelve days without drinking ; and if, during this space of time, his food has been still more scanty than his sober habits demand, or the few dates, beans, or cakes usually in store for him are exhausted, the fat which composes almost the whole of the hunch or hunches on his back serves as an extra supply of nutriment : the hunches are reduced ; their substance, re-absorbed, returns into the general circulation, and supports him to the end of the journey, or until he sinks under privations which no other animal, differently constituted, could have borne for half the period.

The Camel sees and hears well, but of all his senses that of smell is the most acute ; by this beneficent provision, when long deprived of water, he will snuff the air and discover its presence at the distance of more than two miles, and disregarding all opposition, hasten to obtain it ; stirring the water with his feet to a state of mud before he drinks. By this faculty of the Camel, whole caravans are sometimes saved from destruction, so that it is not only eminently useful to himself, but of the most vital importance to all who share his dangers and fatigues.

To the wild Arab of the desert, the Camel is all that his necessities require ; he feeds on the flesh, drinks the milk, makes clothes and tents of the hair, belts, sandals, saddles, and buckets of the hide ; he conveys himself and family on his back, makes his pillow of his side, and his shelter of him against the whirlwind of sand ; couched in a circle around him, his camels form a fence, and in battle an intrenchment, behind which his family and property are obstinately and often successfully defended ; the dung furnishes fuel and litter for the horses, and the urine produces sal ammoniac.

All these advantages are a necessary result of the con-

stitutional faculties and structure of the Camel, when residing in the locality assigned him by nature; under another atmosphere, his qualifications become less important, and his conformation less applicable. In Tartary and Southern Russia, where the Bactrian species (longer of body and shorter of limb than the Arabian) is harnessed to wheel-carriages, and even to the plough, the elevation of his shoulders evidently produces a waste of strength; and in a country where herbage and water are proportionably abundant, his sobriety is not required. If the Camel is transferred to rocky and mountainous regions, his feet soon wear, and he ascends and descends with great awkwardness. If he be brought into temperate regions, the frequent mud, and above all, the thawed snows, soften his feet, and he is unable to work; as is at least partially experienced in central and Northern Asia, notwithstanding that the Bactrian Camel, again provided by nature for his particular locality, has soles of greater hardness than the Arabian, and the dissolution of the snow is exceedingly rapid when once begun.

Although the Greek and Roman writers take universally as little notice of the Camel as an inhabitant of North-Western Africa or Egypt, as they speak repeatedly of him in Syria, Arabia, and the rest of Western Asia, we may conclude, from the above considerations, that the predestined habitation of the genus was on the sandy deserts of the Zahara, as well as the plains of Arabia, Persia, the Indies, and Southern Tartary.

The silence of profane writers is compensated by the 16th verse chap. xii. of Genesis, where Pharaoh, the King of Egypt, bestows camels upon Abram; consequently their presence in the valley of the Nile is established before the æra of the earliest Greek or Roman writers. In all obvious cases, the intelligence of man may be considered as acting in unison with the intentions of nature; now, as

this sagacity to appreciate his own interests had already in the earliest ages carried the Camel over India, China, and middle Russia, it is certainly rather surprising that the Romans, in their frequent wars in Northern Africa, should not have found them of sufficient importance to be mentioned, till Procopius first notices Camel-riding Moors in arms against Solomon, the Lieutenant of Belisarius: from that period, and most particularly during the progress of the sword of the Koran to Morocco, the Camel is the most striking, and considered the most useful, animal in the country. It is probable that this animal increased in proportion as agriculture diminished, at least the two facts are coeval. With the Koran, also, the Camels first crossed the Bosphorus, and spread with the Turks over their present dominions in Europe; the late Emperor Leopold, when Grand Duke of Tuscany, introduced them into Italy, where they have since multiplied considerably, and they would no doubt be useful in rural economy, if transferred to our colonies of the Cape of Good Hope, Sierra Leone, and the interior of New Holland.

The Camel, emphatically described by the Arabian epithet the *Ship of the Desert*, is in truth the link by which many nations separated by boundless wastes are connected, not only in all their commercial relations, but even in almost every communication: his strength, docility, and endurance of privations alone render the intercourse practicable: but it is only in those regions that his utility stands unrivalled; in other countries, as for example India, his qualifications are less pre-eminent, though certainly still invaluable. In that country thousands are employed to convey the baggage of the British armies, but they proceed with difficulty through broken ground; from the length of their legs, they are apt to, what is termed, split, or dislocate their limbs on slippery soil; still in prolonged forced marches they keep up better than elephants or

oxen. It is asserted that the Bactrian species will carry from one thousand to one thousand two hundred weight ; but the Arabian, as used in India, seldom bears more than seven hundred, and under this load will move, at the rate of two and a half miles an hour ; across the immense plains of the Zahara, where water and food are rarely dispersed, their journeys being necessarily longer, are made at the rate of three miles the hour, and the animals seldom carry more than four hundred weight.

The Camel was used in war long before the invasion of Egypt by the French. Without referring to the ancients, the Chinese employed them in 1755-9 against the Eleuths : their Military Mandarin and Commander-in-Chief, Akony, carried swivels on their backs. In India, camels similarly armed precede the Nabobs on occasions of state, to fire salutes ; and the East India Company maintains a corps of dromedaries, mounted by two men each, and armed with musquetoons or swivels. Amongst the Arabs and Tartars the Camels are led out to browse on the pastures in large flocks, the males being kept separate from the females, and both return at night to the habitations ; their tongue is soft and long, and they are particularly fond of salt. The males, more especially in the rutting season, are impatient and quarrelsome among each other. In their battles they bite with great vehemence, endeavouring at the same time to press their opponent down with the weight of their shoulders. In these struggles they *madden*, as the translator of Antar expresses it, at each other, with awkward fury, till one is compelled to fly, or is thrown down and trampled upon by the victor. At this period they are, on certain occasions of festivity, led out and made to fight for show ; and we must not upbraid the patient cruelty that excites them to the combat, since this favoured country, with all its enlightened philanthropy, is not without its numerous abettors of similar disgraceful practices. Aleppo

appears to be the principal place where the combats of camels are among the public amusements.

But beside the use of his formidable teeth, in resisting the ill treatment of man, or the aggressions of dogs or hyænas, the Camel kicks with the hind feet and strikes with the fore. We have an instance related by an eye-witness of the dreadful bite of this animal, which happened in India, when a *Must* Camel (one furious in the rutting excitement) tore off the arm of a lad, whose person was with difficulty rescued from the further grasp of the ferocious beast; which, when the victim was withdrawn, stood in terrific exultation over the torn limb, nor suffered any one to approach it, till his attention was attracted by some other object. Under these paroxysms of fury, and also during copulation, they foam at the mouth, and protrude from between their teeth a membranous bag of a blood-red colour, which hangs on one or the other side of the mouth, and appears, by the late investigation of Professor Savi of Pisa, to be no other than the uvula, which, contrary to what we find the case in others, is in adults of this genus greatly developed, and so constituted as to be inflateable and protruded under certain circumstances of excitement. There remains, however, some doubt whether this organization is absolutely similar in all the Camels, it having been observed at Paris in some, and not in others, a circumstance which Mr. Ritcher of Königsberg considers as perhaps an indication of difference of species.

Although the external appearance of the Camel is disagreeable, his memory is good; this enables man to train him to lie down to receive his load, and again to be unloaded: some it is said will even assist in the performance of this business, but the burden imposed upon them must not exceed their strength, or they will refuse to rise, and become very obstinate. From the great docility and patience of the animal, evinced by the numbers which con-

stantly perish under their loads, it must be inferred that this obstinate refusal arises from the presentiment of their inability to perform the task imposed: the conviction of which is manifested to them when endeavouring to get the hind legs under them in rising, for they feel the weight in the first instance upon the loins, where Camels are weakest. Under the load which they will carry without compulsion, it is often observed in caravans, when the fatigue becomes excessive, that the Camels begin to perspire profusely, and if in this state they cannot be speedily relieved, they soon drop, and discharging a quantity of water from the mouth, expire. Their usual progress in travelling depends on the assigned stations, which vary according to local circumstances, mostly dependent upon the presence of water; they are in general from sixteen to twenty four miles distant from each other, and the enormous weight of one thousand and twelve hundred pounds imposed, is not what is actually carried on the road, but generally superadded before they enter towns or places where duties are levied by the load, which causes the drivers to pack the burdens of three upon two camels until they have passed the custom-house, the light camels paying none. But for speed, and on urgent occasions of danger, the Arabs of the desert will go fifty miles and more in twenty-four hours, with their loaded household camels; and the variety of the true Dromedary, or Mahairy, carrying only a single man, moves with wonderful rapidity, leaving a caravan, to reconnoitre in the desert as far as the eye can reach, and returning in an incredibly short space of time; these will traverse for several successive days spaces from seventy to one hundred miles in the twenty-four hours*. The

* It is somewhere asserted that a Bedouin carried a letter upon a Mahairy in four days from Cairo to Mecca, a distance of at least six hundred miles. If the fact be true, it can only have been effected, we think, by the Arab having somewhere a relay.

genus is exclusively confined to the ancient continent of the world, and the two known species, possibly both originally Asiatic, have each a considerable variety of breeds or races, adapted to the different wants of climate or locality, for burden or speed, the result of long subjugation. Both appear by nature to be clothed in a warm fur, which becomes scantier only in those which reside in hot regions, and this circumstance seems to be a fair indication that their primitive *habitat* was in a region occasionally cold; perhaps the southern foot of the Caucasian Mountains was assigned to what we now name the Arabian species, and the arid plains beneath the northern confines of the Paropamisaden range, the wildernesses of Gaznak and Chorasmia, east of the Caspian Sea, to the Bactrian; at least some inferences to that effect may be drawn from scattered hints in the Zend, the poems of Schah named Ferdusi, and in the Arabian epic composition Antar, which dates at least as early as the Hegira. In colour the several breeds differ, from a deep brown, which appears the primitive, to fawn colour and white; at this day, those residing towards the north are thickly clothed in autumn and winter with two kinds of hair; one fine, woolly and frizzled, the other long and straight; both are well known ingredients in manufactures by the names of Mohair and Camlets. In the spring, immediately after the rutting season they become partially or entirely naked, from whence we would induce a further confirmation of the above geographical position, as at that period the latitudes indicated are already sufficiently warm.

The frizzled hair is almost entirely replaced in the South by a shorter, scantier fur; and the long, less rigid, is confined to the fore part of the neck, throat, shoulders, and hunches. From the period of heat in the animals, which occurs early in the spring, the males, who are then what is termed *must*, are observed to abstain in a great measure

from food ; they waste in strength, discharge a fetid humour from the glandular orifices at the back of the head ; their eyes appear inflamed ; they foam at the mouth, and occasionally protrude the ensanguined bag already noticed ; the hunches on the back waste by degrees till they collapse in the form of an empty bag, and they shew the singular propensity to discharge their urine upon their tail, drawn for that purpose close under the legs, and then to whisk it smartly over the back. Copulation is effected, by the male biting the female till she is compelled to lie down, or in other species to drop on the fore knees ; at this period the male organs change their reversed position, and assume the direction common to most other animals. The females are gravid a twelvemonth, and produce only one at a time ; the Calf is born with an incipient hunch, the eyes open, and without the callosities on the sternum and joints, which appear only as it increases in growth. It sucks a whole year, insensibly learning to browse ; at the end of the second year puberty commences, but four years elapse before it is adult, and six or seven ere it reaches maturity. According to the treatment which camels endure, their longevity may extend to thirty-five or forty years, but in India they are considered old so early as their nineteenth.

Buffon and others imagined that the Bactrian and Arabian species were specifically the same, because, as stated by Olearius, they intermix and produce a prolific breed ; but this opinion is not general ; and M. F. Cuvier justly observes, that if the fact were true, it would not singly constitute sufficient proof of identity in the species ; and although it must be admitted that, without the difference of the hunches, there are scarce sufficient characters to distinguish them, still it would be necessary, before the opinion of Buffon can be adopted, to shew the intermediate breed proceeding from the commixture of the two species.

Some inference of the state of their intelligence may

be drawn from their obstinacy on some occasions, and their impatient haste for vengeance on account of ill usage on others: he who has given offence is sure to incur their resentment the first opportunity; but having once gratified this feeling, all remembrance of the injury is past. From a knowledge of this fact, the camel-drivers, when they have cause to apprehend this vindictive trait in the animal, drop their clothes in his sight, and conceal themselves; the beast instantly rushes at them, tosses them about and tramples upon them; when his anger being satisfied, the driver re-appears, and the whole business is forgotten.

The *Bactrian Camel* (*Camelus Bactrianus*, Linn.) is readily distinguished by the two hunches, one on the shoulders, and the other on the croup: his height may be considered as superior to the Arabian, and the bulk of his body more considerable. The large breed of this species attains seven feet and a half from the top of the hunches to the ground; the legs are proportionably short and the body long; they have a considerable fleece or coat of hair, generally of a dark brown colour. It forms a very large tuft, covering the whole crown of the head, and is likewise very abundant on the arm, and round the fore-knees, the throat and hunches. Their rutting season commences at the end of Autumn, and lasts nearly four months; at the end of which time their hunches are sunk into a mere skin: in the beginning of spring they cast their coats, and are naked nearly two months. This species is considered as originally extant in ancient Bactriana, the present Turkestan, and the country we before indicated, under its ancient and indigenous names; they have spread from thence over Tartary, Persia, Thibet, and China. It appears that it is this species noticed in the Antar, as "unknown among the Arabs or in Cahtan (*i. e.* Eastern Arabia), and only found in the dominions of Kosroe or Irak." If we take the Tartarian

name Tjuga as the original, the Persian Tjuter, and the Tue, Tua, Dui, Tego, Tymi, and Tœmestri of the other nations of Central and Eastern Asia, may be considered all as derived from the same root, and support the opinion, that the species with an indigenous name was not imported from the south. It is probably also the origin of the Chinese Tong; they having a breed, it would seem, of this species, so peculiarly fleet as to be named Tong Kyo Fo, or "camel with feet of the wind;" the Greeks of the Roman period seem to have designated this species by the name of Ditylus.

The *Arabian Camel*, (*Camelus Dromedarius*, Linn.) is the species with only one hunch, and of which the Dromedary, properly so called, is a breed: thus also the names of Ashary, (the Oosharee of Antar) Mahary Oont Egin, &c., designate breeds, among which the Mahairy, or Dromedary of the Greeks, is the most celebrated for speed. Nago designates the female at least among the Western Arabs of Morocco. In this species, the contraction of the abdomen close under the pelvis, is still more remarkable than in the preceding: the hunch is broader, placed more on the middle of the back, and lower; but the legs are more elevated and slender. It appears to be divided in a similarly great number of breeds or varieties, all, nevertheless, depending on the very trivial distinctions of colour, size, and form: in height they do not exceed seven feet: those of Turkey are the strongest and best suited for burden, those of Arabia and Barbary the lightest, and those of India, where there are breeds for both purposes constantly supplied by fresh importations from the north-west; yet probably inferior in their class to those more in the vicinity of their original climate. The rutting season commences in Spring, and lasts only two months, at the end of which they do not become so completely naked as the Bactrian. The females are usually preserved from labour, browsing

at liberty in a gravid state, or furnishing milk to their owners, who load them only when moving their women and children.

This species extends from the foot of Caucasus over Persia and Turkey, Arabia, Northern Africa, and India.

The brown, or Turkish variety, has long been used to draw water, by moving in a circle attached to a machine, at the Menagerie of the King's Garden at Paris; and at this work, M. F. Cuvier observes, it executes a more laborious task than two horses could perform, although its food is less; and he infers from this, that the variety in question might be introduced to advantage in the domestic economy of Central and Southern Europe, especially as experience has proved at that place, that their successful propagation in that latitude seems to demand little precaution or trouble.

The LAMAS. (Auchenia, Illig.)

The *Auchenia* or *Lamas*, form a secondary group of camels peculiar to America: designated at first as a kind of sheep, they were long known in Europe; but from the particular reserve which characterized all the concerns of Spanish Colonies, their real history and genus was barely indicated, till the Abbé Beliard furnished Buffon with details, which even more recent writers have not known how to appreciate. The Count and Linnæus admitted but two species, resting indeed upon individuals brought alive to Europe; but Molina, writing more from memory than documents immediately before him, led Shaw, Schreber, and others, to admit five. More recent observations have established three, and it is probable that the remaining are varieties, produced by climate and domestication.

Originally the Peruvian word *Lama* may have designated only one of the species, which by extension was subsequently applied to all: there is indeed so general a

resemblance in all of them, that, at this moment, the propriety of the application of the specific names to the individuals exhibited in England and France is, to say the least, very doubtful. To ourselves the confusion is very apparent, from the number of living specimens and stuffed skins we have had occasion to delineate and compare both in the New World and in Europe. In M. F. Cuvier's An. Lithog. a figure, given as of a male Lama, may be suspected to belong to Vigogna, or, if a Lama, of a breed scarce more than half the size of the larger species. In London another animal, exhibited as a Lama, was of the dimensions and breed of those which in America were specified as Guanacos. A white individual in the possession of Her Royal Highness the late Duchess of York, approaching in size the usual stature of the smaller Lama, but with a coarser hairy coat than is found in other animals of the genus, was perhaps the true Guanaco. The Lamas or Alpacas repeatedly exhibited in London since 1816 and 1817, varied in size, though similar in the distribution of the colours, but differed in several particulars from another figure in M. F. Cuvier's An. Lithog. The true appropriation of the names and distinction of the species is, therefore, a desideratum, which must be left to a competent naturalist in Peru.

The Lamas bear a general resemblance to Camels on a reduced scale, and without their heavy and stupid aspect: the deformity of hunches does not load their backs, and instead of a bent neck, they carry their heads nearly perpendicular; which, together with the long pointed and moveable ears, animated large eyes, and small noses, gives them that air of sprightliness and activity which they actually possess. The principal organic difference which distinguishes them from camels, consists in the conformation of the toes, which are not, as in the Camel, united by a common sole, and in being destitute of the additional apparatus

in the ventriculus for water: the dentition is nearly the same, excepting that they want the canines in the lower jaw.

Most species are readily tamed, and even capable of considerable attachment to their keepers: all are believed to have their types still in a state of freedom, mostly at considerable elevations along the flanks of the Southern Cordilleras; where they live gregariously, sometimes assembling in herds of considerable number. By the conformation of the toes, they are much more sure-footed than true camels could be in rocky places and among slippery ice and snow, where they shew a decision and a vivacity of action, not unlike deer. Although no apparent provision is made to enable them to live deprived of water, it is known that they drink seldom, and in some cases not at all. They are curious and timid, but not very shy; some have a feeble bleating, others it is said, a neighing voice. They void their urine like the Camel, and are inclined to dung in one place: the females have but two teats, and, consequently, they produce, in all probability, but one at a time: of the time of copulation, gestation, &c. nothing is yet known.

Before the conquest of Peru, they were the only beasts of burden employed by the natives; since that time the increase of horses, and the superior vigour and sagacity of mules, have diminished their importance and consequent numbers among men: still, however, many are used by the poorer inhabitants, in the difficult passes of the mountains. When overloaded they are apt to lie down, and refuse to rise, notwithstanding every method is tried by the drivers; yet the larger species will carry, as we have had occasion to witness, a full grown man, and trot or rather run with great swiftness for several miles. The weight usually imposed does not exceed one hundred and fifty pounds, which they convey from sixteen to twenty miles in a day, with

very few attendants, among precipices and over rocks with great steadiness.

As their flesh is edible, the hide useful, and wool a valuable article in manufacture, they are so profitable, that little doubt can arise that the procreation of breeds of these animals in New Holland, and even in the mountainous parts of Southern Europe, would be attended with valuable results in rural economy. In Spain, some endeavours of this kind have been made; but the apathy and want of perseverance which seems to extend over all the enterprises of that people have rendered them abortive. Several of the facts and opinions here adduced are due to a friend, who travelled by land from Valparaiso to Carthagená.

Beside the species which we shall describe, with some positive means of discriminating, authors have noticed the Chilique, *Camelus Araucanus* of Molina, and, perhaps, the *Mormorus* of Nieremberg. In size it is reported equal to the Lama, but in appearance resembling a ram, with pendulous ears, long neck and legs, and tail resembling that of a sheep, but shorter and varying in colour in different individuals. But as this animal is asserted to have been the species originally domesticated by the Caciques, and even to have drawn a sort of plough, the trifling differences which separate it from the Lama may be regarded as the result of a particular breed, more completely degraded by long domestication and severe labour.

The *Huemel* (*Equus Bisulus*, Mol.) is perhaps a real species of this genus, which from its neighing voice and some fancied resemblance in size and colour with the Ass, has been admitted without sufficient reflection in the catalogue of nomenclators, as a species of horse. It is described as wild, strong, and swift, and residing in the rocky regions of the Cordilleras of Chili, as far south as the Strait of Magellan.

The *Lama*. (*Camelus Glama*. Lin.) This species is

considered by Baron de Humboldt as entirely domesticated, the occasional wild animals being only strayed individuals. From this circumstance he infers that their specific characters are not easily marked with precision; because, in a domestic state, several breeds are reared, among which the original type is more or less disfigured. Among the individuals examined by us, the variations of size, colour, and conformation, were certainly evident, especially if the animals designated as Guanacos be considered as a mere variety of the true Lama. But as this question is subject to doubt it will be preferable to describe them for the present as a distinct species.

A Lama of the largest breed is about four feet four inches at the shoulder; above five feet from the breast to the tail, and from the ground to the top of the head nearly six feet. There are, however, breeds far inferior in stature, and the specimen described by M. F. Cuvier did not reach three feet in height at the shoulder. This individual was a male of a brown colour, the face white, with dark spotted nose and mouth, a spot before and one behind the eye extending to below the jaw. The throat was whitish and the neck gray. The joints of the fore-feet white. These animals, however, vary in colour and markings, but the prevailing tones are brown, passing into vinous rusty dark brown, black, and even white. The hair is long, soft, elastic, and woolly on the neck, throat, body, rump, and tail; close and short on the head and limbs. The fine specimens exhibited in London in 1816 and 1817, were entirely white on the head, throat, neck, shoulders, and fore-legs; from the withers backwards of a deep purple brown; from the chin, down the neck and throat, fine soft hair, about nine inches long, hung down to below the knees in the form of an apron, with a beautiful silvery lustre. On the back, rump, sides, and tail, the fleece was more packed and woolly. The hind-legs were earthy

brown. One specimen, a male, was about four feet high ; a female, considerably lower, had the same distribution of colours, with the addition of a dark spot on the lips, several smaller on the ears and on the fore-legs. They were considered as Alpacos, but their superior size, and the presence of callosities on the limbs, if this distinction be permanent, places them among the species of Lama. The male was accurately figured by Mr. Agasse, and the female, which was shewn afterwards by Mr. Howitt*.

The head of the Lama is thick in proportion to the length, the lips tumid, the ears rather rounded at the tips, and the forehead covered with short close hair. The legs are stout, the back straight or slightly hollow (perhaps from early imposition of burdens). The diameter of the ham, from the hip to the tail, rather broad, and his feet spread. His manners are gentle and confident, and shewing but little vivacity ; but his carriage is graceful, and seen in front, with the splendid white clothing of the throat and breast, beautiful. These observations on the proportions of the animal are, however, relative, and should be borne in mind when compared with other individuals exhibited as the Guanaco.

The *Guanaco* (*Camelus Huanacus*. Gmel.) Without as-

* This figure is engraved in the work, and by mistake named Alpaco, because the specimens were exhibited as such. On comparing the figures of Gesner and Schreber, it is evidently the same animal which they have represented as the Guanaco, and we have here a striking example of the confusion which reigns on this subject. If the animals here given be not Lamas, but Guanacos, it follows that those described here as Guanacos must be another species or strongly-marked variety, not so much of Lama as perhaps of Chilihueque, or a species as yet unknown. The hair ascribed to my lamas is a mere different state of their fleece. Gesner representing his at the renovation of it, and mine at its greatest length, taking Gesner's *Allocamelus* as represented in Shaw's Zoology.

suming that the animals shewn under this name were the real Guanaco, or that, if such, they form a distinct species, their form and character is sufficiently different, to render a separate description most advisable. The specimens exhibited in America and London were in height something more than four feet; and their necks being proportionably longer than the Lamas, the top of their heads was about six feet from the ground. The head was longer and the nose and lips much smaller and more delicate than in the former animal; the ears longer, more moveable and pointed; the forehead covered with a sort of brush of standing woolly hair. The back was arched, and the tail carried erect or even reversed upon the back; the abdomen, drawn up high under the pelvis, gave an air of weakness to that part; the diameter of the rump shorter, and the limbs finer and more elegantly formed than in the preceding. In attitude, the head was carried upon a neck perfectly vertical, shewing an inaptitude to look round or on either side; for when this was required, the whole animal turned. The individual more particularly observed shewed attachment to his keeper; he was jealous, would lay the ears back, stamp with the fore, kick with the hind feet, spit, or rather squirt saliva at those who gave him umbrage, or who gave potatoes or apples to other animals in his presence. He would occasionally carry his keeper, and run for a couple of miles with such velocity as to distance horses at a round trot. His head was white, with a rusty spot on the nose and some gray about the cheeks; the neck, covered with a short wool, was buff in front, whitish on the sides, and gray behind. The breast and shoulders were covered with loose and soft white hair; the back, hinder shoulder, sides, and rump, with shortish woolly hairs of a dried rose-leaf colour; the legs, sternum, belly, and region around the anus, dun; the tail, black above, was edged with longish white hair, and naked below. The callosities on the limbs



GUANACO

Engraved by W. & A. P. Phillips, 1854.

were small, on the legs scarcely perceptible, the toe-nails very small.

Although the aggregate of distinctions produce a figure very different in aspect from the Lama before described, and from another individual similar to this, excepting that the colours were more buff and dun (which was shewn in London, and is figured under the name of Lama in the work), there is still no prominent character by which they might be positively separated, and we have to adduce one more, which, perhaps, may be the true Guanaco of authors, and yet it assimilates in some particulars most with the Lama.

This individual was kept at Oatland, and was the property of Her Royal Highness the late Duchess of York. It was not above three feet at the shoulder, the back was slightly arched, and the tail carried close; the ears were long and round at the tips; its colour wholly white, with black spots on head, neck, limbs, and belly, and larger, paler spots on the sides and back; the texture of the hair was coarser, short on the head, neck, and legs, and longer on the other parts.

It may be that the specimens here noticed are the Lama, either in an unreclaimed state, or at least not so completely altered by domestication as those before described, and that it is to these authors refer, when they represent them as descending from the high Andes on the approach of the winter months, to the middle regions, moving boldly, and bounding with the vigour and swiftness of the Stag. They add that the young are hunted with dogs and the Lazzo; but that the elder must be shot; their venison, when young, being of superior quality; but when old, that it is then either salted or jerked.

The *Paco*. (*C. Paco*, Fred. Cuv.) The *Paco*, or Alpaca, was first clearly described by M. Frederick Cuvier in his *Mam. Lithog.* 1821. His specimen, kept in the gardens of

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the Menagerie at Paris, measured three feet two inches and a half at the shoulder, four feet three and an half to the summit of the head, and three feet nine from the breast to the tail. It was a female, extremely gentle, but timid. It would blow and spit at strangers, move in a canter, deposite its dung in one spot always as far as possible from the stable, and bleat like a young lamb. The positive character by which it was clearly distinguishable was the total absence of all callosities on the sternum and limbs. The colour of the neck, back, flanks, and breast, was fulvous-brown, tail brown, head mostly gray, darker on the nose, and rusty behind the ears, where there was a white spot. The legs and feet were dark; inside of the thighs white; from the nape of the neck all over the body and tail the hair was long, soft, and woolly, of a delicacy and elasticity approaching that of the Angora Goat, and so abundant as to give the figure of the animal a clumsy appearance. The able naturalist above quoted observes with great judgment upon the advantages that might be derived from the introduction of this species in our domestic establishments, both as an article of food and a manufacturing object.

The *Vicuña*. (*Camelus Vicugna*, Lin.) This animal was originally described by Count de Buffon, *Suppl.* vi. p. 215: this species most celebrated of all the genus, for the fineness of the wool it affords the manufacturer, inhabits the highest points of the Southern Andes. In size, it is much below the others, not measuring more than two feet eight inches at the shoulder; light of form, short body, with a long straight neck, elevated croup, and in general shaped like the former, excepting that the eyes in proportion are very large, dark, and prominent, and the face and nose small and rounded. It exhibits great liveliness and even vehemence of character, but is easily intimidated, even to stupor.



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A specimen which fell under our observation in South America was of the above dimensions. On the back and sides it was of a reddish-brown, or dried rose leaf colour; the breast, belly, inside of the thighs, cheeks, and outer surface of the ears, and under part of the tail, were white, interspersed with buff; the limbs were dun. It refused water, was petulant, and would offer to bite; seemed to bear the heat of a tropical sea-shore with uneasiness, and preferred sweet potatoes to other vegetables, although from the natural abode of the species, Lichens must be its usual food.

The fleece of these animals, well known in commerce, is an object of importance in South America; but then alive Indians and the settlers in the country, alike indolent and improvident, prefer the destruction of the animals in the chase, to the more profitable and lasting advantage of rearing them in flocks. It is however to be expected, that the political changes which South America has undergone, may introduce a more rational and a more enlightened practice. The mode hitherto adopted to obtain them, it is said, was by stretching ropes, to which bunches of feathers were attached, across the passes of the valleys below their abodes, and driving them down in the required direction, till they came upon these objects, when (similar to the Fallow-deer of Europe) the herd would stop in terror, at the fluttering of the feathers, and wait to be slain or noosed by the Lazzo, or even taken by the hand, unless an Alpaco were among them, who, not intimidated by this contrivance, would leap over, and then the whole would instantly follow its example.

The MUSKS. (Moschus, Lin.)

The animals included in this genus assimilate in so many particulars with the Deer, that they have been classed with propriety in the same family, succeeding in the first place the ruminants of the Cameline group, because they are,

like them, destitute of horns, and preceding the Stags, whose horns are deciduous. They are externally distinguished from all other known ruminants, by this deficiency of horns, but they have, in common with the Stag, two pointed and edged incisors or canines in the upper jaw of the males, which extend in some species outside of the mouth. Internally, they have a peroneum, which is wanting in other ruminants. The eyes have no distinctive character, are destitute of a lachrymary sinus, and the nostrils are divided by a small muzzle, as in the Stag; the ears are either short or pointed, the tail short, and the females have two or four teats.

Their fore-quarters are lower than the hind, and with some exception in the Tibetan Musk, their attitude is low and crouching, bearing the body, which is heavy and clumsy in proportion to the delicacy of the legs, low, and the head straight forward. It is probable, that in manners, they resemble the small forest Antelopes, being, like them, shy and solitary, inhabiting rocky woods. In a domestic state, the individuals which have come under our notice, were lively, ran about with agility, shewed little instinct or attachment, but were gentle, and uttered occasionally a weak sort of guttural grunt, without apparent motive. They were fond of hiding in corners, lying down often, and shewed a slight indication of callosity on the sternum and knees.

All the Musks are probably natives of Asia and the great Islands of the Indian Ocean. Seba and Shaw have figured several small animals, supposed to belong to this genus, but among them, those of South America are in all likelihood fawns of some sort of deer, and those of Africa, females of the Gueveis or Royal Antelopes, which, with a similar stature, form not a single species, but a small group.

The *Thibetan Musk* (*Moschus Moschiferus*, Lin.), was

unknown to the ancients, and although the drug which this animal bears, was employed from time immemorial in central Asia, and subsequently in Europe, no notice of the species to which it belongs existed, till Abuzeid Serassi, an Arabian author, described it as a deer with horns. Serapion, who flourished in the eighth century, according to Shaw, was the first who introduced a knowledge of the animal into western Europe. Avicenna, Gesner, Aldrovandus, Kircher and Boym followed; but Grew gave the first satisfactory description. At length Buffon collected the scattered notices of authors, and having obtained a living specimen, his and Daubenton's descriptions, united with Pallas and Gmelin's, determined its locality in the general system of organized beings.

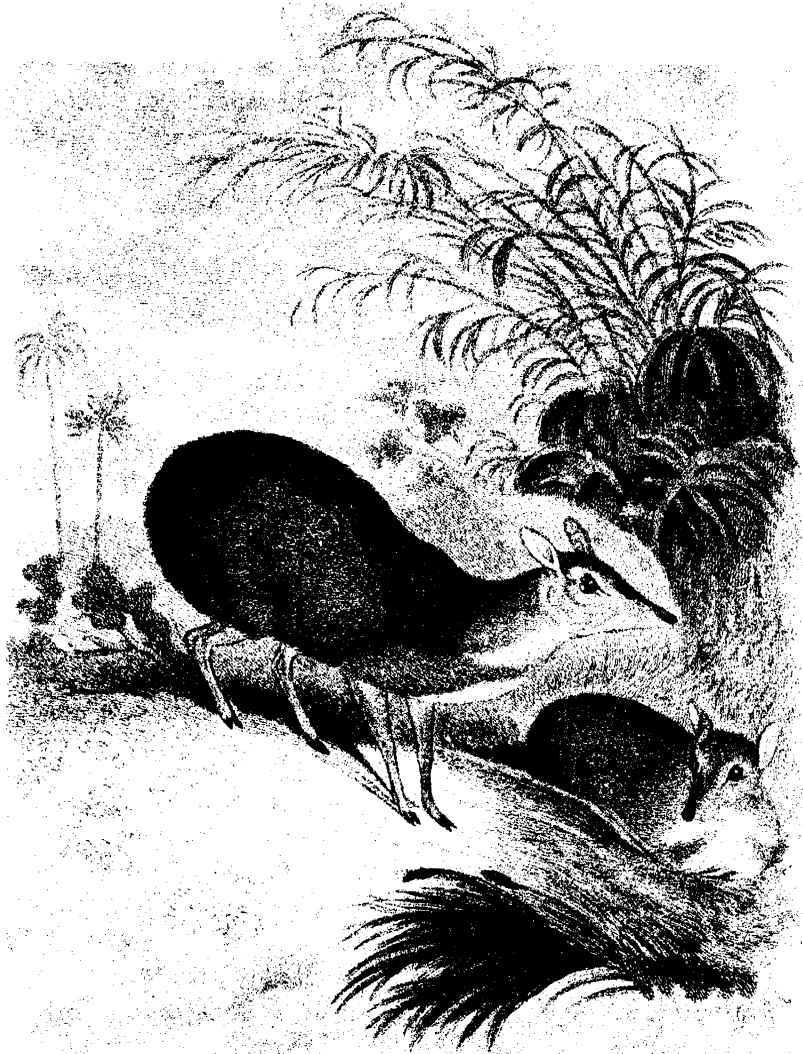
The animal is nearly the size of a roebuck, with a head similarly shaped, excepting that the upper lips are broader, owing to the two canines which hang out on each side of the mouth, and that behind, at the angle of the gape, are two tufts of hair. The texture of the hair is coarse, nearly all white at the base, but ending in brown, dun or black tips, which produces a different shade of colour, according as the creature is seen in front or flank. The lips, chin, breast, belly, and inside of the limbs, are white; the iris rusty brown; the hoofs long and pointed; and the succentorial very long, serving the animal to grasp the edges of rocks, in climbing or descending in the same manner as the Chamois; the hind quarters are more elevated than the anterior: hence their movements are rather in a canter than a trot, and their habitat requires vigorous leaping, in moving from the barren or snowy regions to the pine zones of the Alpine tracts of central Asia, where they reside; their native region extending from China and Tartary, to the mountains above the sources of the Indus, and north, to near Lake Baical. The province most renowned for the superior quality of the musk of its animals, is Thibet.

The flesh is esteemed, notwithstanding its strong flavour of musk; but the pursuit of the animal is principally for the scented substance generated in the musk-bag, situate on the abdomen before the prepuce of the male, and two or three inches in diameter. The hunting period is chiefly in the rutting season, because at this time the secretion is most abundant, and of the highest quality. When the animal is slain, the bag is cut away and made up into a kind of purse; but from the prodigious quantity sold, it is evident that great falsification of the substance must take place; and indeed it is asserted, that the blood and liver chopped small, and even lead, are mixed with the true musk. Tavernier relates that he bought at one time thirteen hundred and seventy-three bags.

The time of gestation, and other circumstances of the progeniture of these animals, is not as yet perfectly known. They are said to feed principally on roots, for which they dig and cut with great facility with the edges of their canines; and it is probable that the tufts of hairs at the corner of the mouth, are to guard the under jaw from injury during this operation.

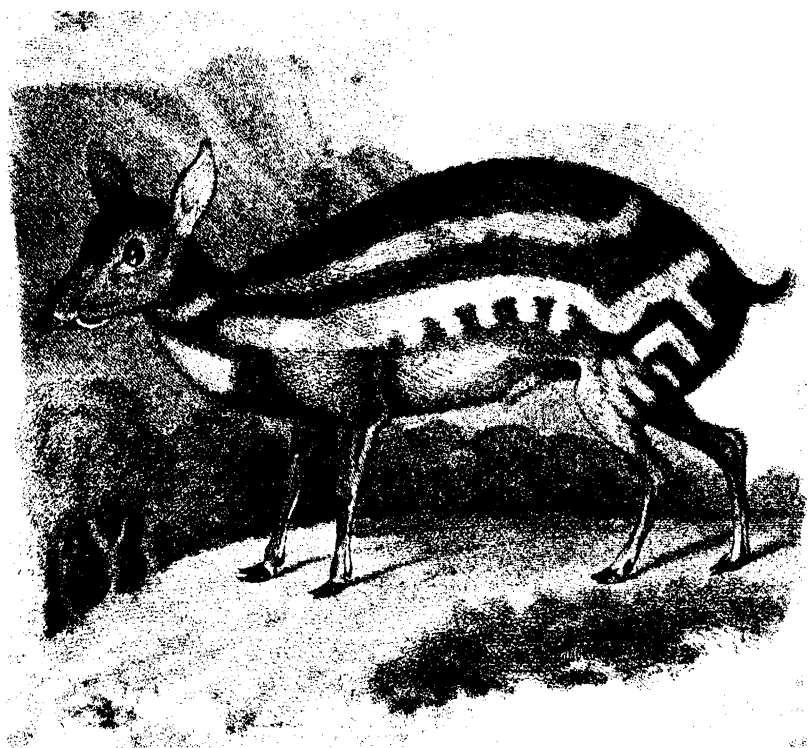
In comparing the descriptions and accounts of friends who have observed them in their native regions, and in India, it would appear that there are two species, differing in stature and in colour. The larger are said to be brown, with longer and more pointed ears, and the canines about three inches long; the smaller, of a slate colour, with broader ears, and some black on the throat. It is probable, however, that these are only varieties of climate or breed, and, perhaps, of sex or age.

The *Pigmy Musk* (*Moschus Pygmeus*, Lin.), admitted in the catalogues upon the faith of the Plate 43 in Seba, is considered very properly by M. F. Cuvier, as a very doubtful species. He justly observes, that the specimen described by Buffon is only a young animal, a fawn. Our own re-



THE PYGMY DEER OF SUMATRA.

M. PYGMEUS, L.



searches have produced several drawings from different museums, at first, without being aware that there was a doubt. On comparing these with Seba's figure and Shaw's, we are inclined to consider them all as the young or the female of *Ant. Pygmea*, for the absence of the succentorial hoofs, is in this case no criterion. As the question now stands, this species may be omitted; although M. Desmarest states that they have tusks or canines, but upon what authority, we do not know.

The *Memima*. (*M. Memina*, Pen. Schreber.) First noticed by Knox, in his account of Ceylon. It is in length about seventeen inches; in colour, of a cinereous olive, with the throat, breast, and belly white, and the neck, sides, and rump streaked in long bars of the same colour. The ears are rather large and open, and the tail very short. We have seen two individuals of this species alive, but they were in so languid a state, as to leave but little room for remark. This animal is not without beauty, resembling the Java and Napu Musks in gait and manners, and belonging, we believe, exclusively to Ceylon, where it resides in the Jungle.

The *Java Musks* appear to constitute a small family, or, perhaps, only varieties of one species. Pallas and Buffon first noticed them, but Sir T. S. Raffles has lately (vol. xiii. *Lin. Trans.*) given a detailed account of them, as also M. Fred. Cuvier, from whose united descriptions we shall endeavour to extract our notice, with such remarks as we have made on a living specimen.

The *Napu*, Raffles (*M. Napu*, F. Cuvier), is the largest, being about twenty inches long, by thirteen in height. It stands considerably higher behind than at the shoulder. It is of a mottled ferruginous colour on the back, gray varied with white on the sides, and white below and on the inside of the thighs; tail from two to three inches long, tufted, white below and at the end. A white stripe runs along the

base of the lower jaw on both sides of the posterior angle : the space between is also white and gives origin to three white stripes, which run to the shoulders and middle of the breast, forming thus five white divided by four black lines. The top of the head is flat and of the same colour as the back, which, however, becomes darker on the ridge of the neck ; a line of naked purplish black skin runs from the eyes to the nose, and a gray stripe some way along the belly. It has short spurious hoofs. Its physiognomy is very like that of the Agouti ; but the comparative bulk of body, contrasted with the extreme delicacy of the limbs, is very remarkable, and forbids powerful efforts in leaping : it sits often gathered up like a ball, and walks rather heavily. The females have four teats which seem by their proximity to form one udder.

This species frequents the thickets near the sea-shore, and feeds principally on the berries of a species of *Ardisia* ; it is easily tamed when taken young. M. F. Cuvier objects, perhaps with reason, to the trivial name of *Javanicus*, which Sir T. S. Raffles affixes to it, and considers it as a new species. An individual which we saw at Baltimore, likewise distinguished by five white stripes, was somewhat smaller and probably younger : the colour was brown, and it ran about with great activity, although, from long confinement, the four joints of the limbs were considerably swelled. There was also not that evident disproportion in the bulk of the body, compared with the legs, and the spurious hoofs were more visible.

The Kanchil. (*Moschus Javanicus*, Pallas and Pent.) This species is smaller, being about fifteen inches long, by nine or ten in height. In form it nearly resembles the Napu, but is lighter and more active. Its colour is very different, being of a deep red-brown, approaching to black on the back, and becoming of a bright bay on the sides, white on the belly, and inside of the legs. It has three white stripes

on the breast like the Napu, but differently disposed. The shape on each side of the lower jaw is prolonged to the shoulder, narrowing as it recedes: the middle stripe is broadest below, and narrows to a point above, never uniting with the lateral stripes. In the Napu, on the contrary, the three white stripes originate from one point, between the maxillary ones, which appears like the commencement of another pair, and all three become broader behind. The head of the Kanchil is not so flat, and the muzzle is more curved above; the black lines from the eyes are wanting, but a well-defined black line runs down the back of the neck, which is not found in the Napu. A brown line passes from between the fore-legs to the middle of the belly. This species is further distinguished by having long upper canines, curving backward, while in the Napu they are short and straight; the tail is from one and a half to two inches long, tufted, white below and at the end. It has spurious hoofs like the former.

These differences are constant at every age, and they differ no less in manners. The species lives in the depths of the forests, and feeds chiefly on the fruit of the Kayo-briong (*Gmellinia villosa*, Roxb. 6.); it will live in confinement, but never becomes tame, endeavouring perseveringly at an escape to the woods. It is a swifter and lighter animal, and is proverbially cunning. It is related, that when taken in nooses laid for them, they will, when the hunter arrives, stretch themselves motionless, as if dead; and if he unties them without further precaution, they will seize the moment to start upon their legs and disappear in an instant. A still more singular expedient, however, is mentioned, that when closely pursued by dogs, the Kanchil will sometimes make a bound upwards, hook itself on a branch of a tree, by means of its crooked tusks, and there remain suspended till the dogs have passed beneath.

No portion of this activity and quickness is ascribed to

the Napu or Pelandok, and to this difference of disposition is attributed ; the Kanchil frequenting the forests without fear of the Tigers and beasts of prey, while the former two seek safety in the thickets nearer human habitations, where they are less exposed to such enemies.

The *Pelandok* (*Moschus Pelandoc*) is noticed by Sir T. S. Raffles, as the least of the three in point of height, with proportionably a larger and heavier body, and a larger eye. By this description it may be presumed that the Napu, as figured by M. Frederic Cuvier, is in reality this species, and that our specimen is the true Napu ; but none of all these notices are completely applicable to a specimen formerly in the Leverian Museum, of which we have a drawing, and which Dr. Shaw figured in the first volume of the *Naturalist's Miscellany*, p. 3. It was in all respects a musk of the Javan group, in colour of a light ferruginous gray, naked round the eyes, but without the streak to the nose. The canines were scarcely visible, and the three white streaks commencing at the union of the white lines running under the maxillæ, branched from thence, one to each shoulder, and the third to the breast, but all united at their common centre, and without the intervention of dark colours. Hence it would appear that these animals vary in the form of colours of the subjugal stripes, that sometimes the two maxillary ones have been overlooked, and, consequently, that the perfect discrimination of species is not as yet satisfactorily established*.

The DEER. (Cervus, Lin.)

M. Frederic Cuvier has given a general view of the animals of this genus, in the *Dictionnaire des Sciences Naturelles*, article *Cerf*. From this excellent source we

* The figure in this work under the name of Pigmy Musk of Sumatra, taken from the life at Exeter 'Change, offers a further proof that the species and varieties are not as yet clearly ascertained.

shall draw our principal observations, and add such remarks from other quarters, or from personal research, as may increase our knowledge on this subject. The word Deer is derived from a Teutonic root, or the Greek $\Theta\eta\gamma$, variously pronounced and written, at different times and by different nations. Dier, Thier, Thur, Anglo-Saxon Deor, designating in general an animal, afterwards confined more especially to ruminants; in the English and German to Cervine; and in some of the Slavonic dialects to the ancient Urus, or the Wild Ox. The genus, comprehended under this denomination, consists of those animals, the males of which have deciduous horns or antlers, destitute of a horny sheath. In general they are remarkable for the elegance of their forms, the lightness of their proportions, and the velocity of their movements. The legs are slender and firm, the body round and compact, the neck long, and the head well shaped. Their look is meek, yet confident, wild, yet curious; the colours of their coat, clean, brilliant, and agreeable. Hence, Deer have been at all times interesting to mankind, and the chase of them the object of the great and wealthy.

The genus is extended over Europe, Asia, and America; it is found in Northern Africa, and in most of the great islands of the Indian Ocean. The Portuguese introduced Deer in the Isle of France, and the British in Jamaica, and the latter, doubtless, soon will import them into New Holland. We have already given some general notions of the characters which are common to all the ruminants, and need therefore only refer to those distinctions which separate them from the other genera. The most remarkable of these are the horns; that is, those osseous productions of the forehead which fall and are reproduced successively, and which, with the exception of the Rein-deer, are the exclusive property of the males. The common opinion, however, of the annual shedding of the horns in the Deer, must be re-

stricted, in all probability, to those species which reside in cold and temperate regions, or who have these productions of a large size. It is the opinion of Sir T. S. Raffles that the Muntjaks of the Indian Archipelago never, or at least but seldom, renew theirs; and our own researches within the tropics of America tend to confirm it, so far as relates to that class of them who have only single spikes, and branched antlers.

Animals offer few phenomena more inexplicable than that species of vegetative spontaneous production, of which the germ is invisible, and which, nevertheless, is subordinate to fixed and precise laws. At a given age the horns of the deer-kind begin to develop; at first a slight protuberance appears, covered by the skin, where a great number of vessels are spread, for a considerable degree of heat is perceptible under it. Soon the protuberance rises, and in some species branches off into ramifications; after a certain period the development is arrested, the skin which had continued to stretch and extend over the whole production, loses its heat, dies, becomes dry, and finishes by tearing off in rags; at length the horn itself becomes detached and falls; a slight hemorrhage follows from the skin or the part of the frontal which sustained it. After twenty-four hours in healthy Deer, the vessels which emitted the blood are closed, a thin pellicle covers the wound, and immediately the reproduction of a new horn becomes apparent; the extremity of the vessels swells, a burr expands around the base where the late horn stood, resembling those on the bark of trees, when they have received wounds which begin to cicatrize: the burr widens, while the vessels which proceed from the bone depose osseous matter. Hitherto the development of the horn has been uniform, the vessels have extended in a certain direction, always the same in each species; but when they have arrived at a certain point, they separate, some continuing as before,

while others turn into new, but always invariable directions, if no accident impedes them. These last, which have formed an *antler* or *snag*, soon stop, but the former continue increasing the beam, throwing off from time to time others, again to form branches, till at length the species of bony vegetation ceases also; the skin or velvet which covers them dries again, and the horn falls, to be replaced by another.

We know nothing of the origin of that power which directs certain vessels of the head to develop themselves constantly into divers but positive directions, and to produce the forms extremely varied in the horns of the deer kind. It is a branch of the science, covered with obscurity, deserving the attention of observers, and promising interesting results. The shedding of them, on the contrary, is explained in a plausible manner; at a certain period of their growth, the basal part of the beam becomes so hardened, that the vessels which pass through them, finish by being compressed and finally obliterated, causing the osseous substance to become insensible, and, like a strange body, to separate from the rest of the organized parts which are still vivacious, thus referring the operation to the principles of exfoliation; but what increases the singularity of the development of antlers in the Deer, is the invariability of the forms, and the constancy of the laws to which this development is subjected. Under similar circumstances the horns of two deer of the same species are of similar form, and the influence of the causes which can modify it, becomes observable most towards the extremities; hence the basal part offers to zoologists one of the most positive specific characters, although the antlers are, perhaps, of all the organs of animals, the most subservient to artificial influence. Thus a stag scantily fed, will carry small and slender horns, without therefore being deformed; if he be in ill health, the horns are likely to become mon-

strous, either from an excess or a deficiency of the substance which composes them. Castration will arrest their expansion, and dry up the source which gave them existence; a wound will give another direction to the vessels, and in this manner produce branches where none would appear otherwise. If in this case one horn becomes monstrous from excess, the other will be so from a defect of substance: to conclude, advanced age has also its influence, the horns then become small, slender, and, finally, irregular.

The flattened or palmated shape of the horns in several species, seems to be a provision of nature to enable the animals to clear the snow off their food, for it is remarkable that this structure is confined to those of the higher latitudes, and rendered applicable in proportion as they inhabit more rigorous climates. Thus, in the Rein-deer, who are absolutely arctic, it is most so, and least in the Fallow-deer, who belong to the colder temperate regions. This form is to be traced even in some of the Antilopinae of America, *Dicranocerus Palmatus*, who resides the furthest north, bearing horns much broader than the next species *D. Furcifer*. The Caribous of America, who have to contend still more with deep snow than the Rein-deer of the old continent, have their horns broader and better adapted to that purpose; besides, both varieties, in addition to these natural shovels, have broad feet, not only to sustain them the better on snow, but also to clear it away. Thus these arctic inhabitants are provided with a double organization for this purpose, while others less northerly ruminants have only one provision; as the horns of the Elk, or the feet of *Ovibos* and *Aplocerus Lanigerus*; these, besides, migrate to latitudes of a milder character. The horns of the Rein-deer, indeed, drop in winter, but this takes place only at a period when the snow is already not only very deep, but frozen hard, and even then we see, that the females, when gravid, and therefore in want of a greater

supply of food, preserve theirs till May. Hence it may be taken as a maxim, that all the horns of a palmated shape belong to species of high latitudes, and that those of this class, which we shall notice under the head of *Cervus Mexicanus*, are, in reality, of animals of cold climates; nay, more, as we know South America to abound in Deer, that we may look for representatives of the Elk and Rein in the high latitudes of Patagonia.

The hair of some species of this genus, presents a character visible also in several antelopes and other ruminants; namely that of being fragile, unlike that of carnivora and rodentia which is elastic; they have in general but one sort, the woolly being in small quantity excepting in the Rein. In summer the most predominant colours are lively, in winter darker; the general livery of the Deer may be considered as of various tones of brown marked with white spots; this livery is permanent during life in several species, still more general in the Fawns of others, but there are, notwithstanding, others who never bear this distinction. Albinism is not uncommon in the Stag and Fallow-deer. Within the tropics the colours of the resident species never alter, not even when those species are brought to and multiplied in Europe. In some, the males have canines; in the Muntjaks they become as long as in the Musk. We have seen one who had them double. The pupil of the eye is a lengthened oval; the feet are perfectly cloven; the ears are large, and hearing very acute; the tongue is smooth and long; and the nose in most species terminates in a muzzle. Their sense of smelling is delicate; also in the choice of food they are select, applying the nostrils and occasionally the opening of the suborbital sinus; which seems to communicate in some with the olfactory apparatus. This sinus is not found in all, some having only a fold of the skin or even none; in others it forms a sack, which, according to Mr. White in his *Natural History of Selbourne*, when speaking of the

Fallow-deer, can communicate with the nose, and, consequently, that they can drink with the nose deeply immersed, without drawing the head out of the water to breathe. This statement has been called in question; but we have witnessed it in the Great Stag or *C. Hippelaphus* at Mr. Cross's Menagerie, and the air passing out of the suborbital sinus, while the animal drank, could be felt by the hand, and even affected a candle.

The voice of the genus in general, is a disagreeable kind of braying. The females have four teats and produce one or two fawns at a time. In temperate regions this takes place in the spring, because the rutting season is in autumn; but in warm regions, where no winter is felt, the regulating seasons seem to be the monsoons, and the rains produced by the passage of the sun to either tropic.

In Deer the intellectual instinct is far from contemptible; in this respect the chase of the Stag is very curious. On those species which live more or less isolated, a certain degree of domesticity may be imposed: but the gregarious, such as the Rein-deer, may be reclaimed altogether; which is a proof in support of the opinion, that gregarious animals alone can be completely domesticated. Some species reside exclusively in forests, others in the open plains or even in swampy meadows.

An artificial arrangement of the species in whatever way it is distributed, is liable to objection; there are, however, several subordinate groups, distinguishable as well by similarity of structure as by the additional advantage of geographical unity, but we must except from the latter particularity those of the higher latitudes, who in common with other animals inhabit certain zones rather than countries.

THE ALPINE GROUP.

The *Elk*. (*Cervus Alces*. Lin.) Moose of America. This animal is the largest of this genus, being higher at the shoulders than the Horse, its horns weigh sometimes



near fifty pounds; accordingly, to bear this heavy weight, its neck is short and strong, taking away much of the elegance of proportion, so generally predominant in the Deer; but when it is asserted that the Elk wants beauty or majesty, the opinion can be entertained by those only who have seen the female, the young, or the mere stuffed specimen: for us who have had the opportunity of viewing the animal in all the glory of his full-grown horns, amid the scenery of his own wilderness, no animal could appear more majestic or more imposing. It is, however, the aggregate of his appearance which produces this effect; for when the proportions of its structure are considered in detail, they certainly will seem destitute of that harmony of parts, which in the imagination produces the feeling of beauty. The head measuring above two feet in length, is narrow and clumsily shaped by the swelling upon the upper part of the nose and nostrils; the eye is proportionably small and sunk; the ears long, hairy, and asinine; the neck and withers are surmounted by a heavy mane, and the throat furnished with long coarse hair, and in younger specimens encumbered with a pendulous gland: these give altogether an uncouth character to this part of the animal. Its body, however, is round, compact, and short; the tail not more than four inches long, and the legs, though very long are remarkable clean and firm: this length of limbs, and the overhanging lips, have caused the ancients to fancy, that it grazed walking backwards. The hair of the animal is coarse and angular, breaking if bent.

The Elk is an inhabitant of northern latitudes; in Europe between the fifty-third and sixty-fifth degrees: making a part of Prussia, Poland, Sweden, Norway, Finland, Lapland, and Russia. In Asia it is found further south, from thirty-five to beyond the fiftieth, spreading over Tartary, and abounding in Japan, if indeed the denomination of Elk is not mistated for that of a *Rusa*, or an undescribed

species. In America, it resides between the forty-fourth and fifty-third degree, round the Great Lakes and over the whole of Canada and New Brunswick.

Its movements are rather heavy, and the shoulders being higher than the croup, it does not gallop, but shuffles or ambles along, its joints cracking at every step, with a sound heard to some distance*. Increasing its speed, the hind feet straddle to avoid treading on its fore-heels, tossing the head and shoulders like a horse, about to break from a trot to a gallop. It does not leap, but steps without effort over a fallen tree, a gate, or a split fence. During its progress it holds the nose up, so as to lay the horns horizontally back. This attitude prevents its seeing the ground distinctly, and as the weight is carried very high upon his elevated legs, it is said sometimes to trip by treading on its fore-heels, or otherwise, and occasionally to give itself a heavy fall. It is probably owing to this occurrence, that the Elk was believed by the ancients and the vulgar, to have frequent attacks of epilepsy, and to be obliged to smell its hoof before it could recover; hence the Teutonic name of Elend, (miserable†,) and the reputation, especially of the fore-hoofs, as a specific against the disease.

During the winter months the Elk resides chiefly in hilly woods; in snowy weather seeking the covers, and in clear the open spaces. In summer, it frequents swamps or the borders of lakes, often going deep into the water to escape the sting of gnats, &c., and to feed without stooping. Its

* This sound is supposed to arise from the snapping of the points of the hoofs against each other; but in a letter to Buffon on the similar sounds in the feet of the Rein-deer, it is asserted to take place even when the animal does not lift his feet, but turns or leans merely, more on one side than the other, and, therefore, that it lies in the joints.

† Another Teutonic name Elch (Elk) or Eilch is supposed to derive from *Heil*, to heal, to be whole, and thus the Teutonic would be the root of the Latin *Alce*, and perhaps the Greek *Elaphos*.

usual food in winter consists of the buds and bark of button-wood, spruce, and juniper pines, birch and maple, and under the snow it seeks stink wood (*anagyris fetida*,) and mosses; but this is always with difficulty, for then it is obliged to spread the fore-legs, or even it is said, to kneel. The branches of trees it turns down with the horns very dexterously; but to get at the ground, we have been assured by Huron and the Canadian hunters, when the snow has fallen only to a foot or two in depth, that the herd, led by an old male, shovel it back, and throw it over their heads; the snow falling on either side, as it slides from the inclined planes of the back of their horns: meantime the fore-feet of all are equally engaged in striking it from under them.

During a part of the year, the herd consists of an old female, two adult females, two young females, and two young males; but during the snowy periods, at least in America, one or more adult males are certainly among them, very old males alone keeping aloof, until the rutting season, unless the winter be very severe. Several of these families keep near each other, and in very cold weather they seek cover together, and remain closely pressed against one another, or trot in a circle, till they have beaten the snow down. When the rutting period commences, which is about the beginning of September, the old males seek the females, and expel the young, who are obliged to keep aloof while the animals remain in heat. At this time they will swim rivers in pursuit of the females, or after them to remain concealed in some of the Lake Islands. The males are then very pugnacious; they bellow often, and sink in flesh. The gravid females bring forth about the middle of May, at first one, but ordinarily two calves, of a brown-red colour. These are so simple and void of fear, that in the first months they are easily taken, and if in the water, where they willingly go to avoid the flies, they will suffer persons

in a canoe to come up to them and take them by the head, without appearing in the least frightened.

The dags, prickets, or incipient antlers, are the first year not more than an inch in length; the second they rise to a foot; the third they are forked, and the fourth they first assume six snags, and are somewhat flattened; the fifth year, the blade is still small, but their expansion from that time forward, is uniform; though it does not appear that the number of snags ever exceed twenty-eight. In a very large specimen which we saw shot, there were twenty-two, the length from the head to the tip, twenty-seven inches, and from tip to tip across the horns, three feet six: the two lower snags on each side separated by a deep indenture; the weight about thirty-three pounds. Old elks shed their horns in January and February, and if lean from a severe winter, in March; the younger later, till the month of May. They are again completely restored in the former by the end of June, and in the latter in August.

An elk killed in Sweden, is said to have weighed twelve hundred pounds; but this must have been a very extraordinary animal: their height is about six feet. A white specimen from Swedish Lapland, in the Munich Museum, five years old, is six Rhineland feet at the shoulder. A female, figured by Mr. Heriot, was seventeen hands high: the large male above alluded to, was scarce four inches more, or about six feet; but he was very deep at the shoulders. Another, whose antlers were still more deeply indented at the base, that is with the parts corresponding to the brow and bezantlers of the Stag, separated from the main blade by a deep intersection, was not more than seventeen hands and a half high. His head measured from the nose to between the ears, two feet three inches; distance between the eyes eight inches; length of the ears nine inches and a half; the lower branches or snags were bifurcated and thirteen inches long, and their united amount was

seventeen, with the rudiment of an eighteenth. The hunters named him a black Moose, and from the greater length of head in proportion to his height, and the particular form of the horns, insisted that this was a different species from the brown. There is, however, no character sufficiently distinctive to claim our assent to this assertion, for it is known that considerable variation in the horns occurs from various causes, although it must be admitted that the almost complete separation of the lower parts into the form of branches, is a very prominent character in most if not all the American specimens, while a similar formation is rare in those of Europe: but the colours of the hair differ with the season; and if this specimen belong to a different species, both would be of that species, the result proving only that the European is not of the same. The two here mentioned were dark, almost black, with gray hairs intermixed, but that with the largest horns had the greatest intermixture of gray; they were killed on the borders of the Saguenai, in Lower Canada, where both they and a herd of buffaloes were considered as strangers. The darkest was shot in September, and the gray in November, which may account for the difference of colour*.

During the time that their horns are sprouting, the animals remain most in willow covers, returning to the ever-green woods when they are restored: their period of life does not exceed twenty years.

They are hunted in North America, chiefly during the early part of winter, and towards the spring. While the snows are not deep, they are not easily attacked; but when they begin to harden, and the hunters run on snow-shoes, they endeavour to turn the game towards ravines, or where it is drifted deep. The Huron hunters have assured us, that when this is effected, he is sure to be soon entangled,

* The measurements were taken by a string, and, consequently, with some curve on the shoulders, and convexity of the nose.

and to flounder in it; but that they must be on their guard, and run instantly upon the deep snow, to fire at him as he turns, because he will endeavour to double on his own track, and charge all that are then in his way. When first discovered, he is often found sitting on his hams like a dog, voiding his urine before he rises to escape. Against the Bear and the Wolf he stands at bay with his horns, acting offensively only with his fore or hind feet; his kick is very powerful and quick: it is said that a small tree is splintered by it.

The Indians are great admirers of the flesh: to us it appeared superior to the Stags; but under the circumstances which admit of this kind of banquet, it may be doubted whether a similar judgment would be passed in the comforts of a home: the nose and the tongue are admitted to be the best parts. Mr. Pennant states that they were once used to draw sledges in Sweden, but that it afforded to malefactors the facility of escaping, and that, therefore, the use of them was prohibited. The hide furnishes excellent leather and buff skin for belts. It is probable that the ancients knew the Elk under the name of Alce, only by description, and when Pliny compares it to a mule, he may have had the female in view. Cæsar certainly speaks of the Alce from hearsay. The Machlis may have been another animal, perhaps the Schelch of the ancient Germans*.

The Crowned Elk. (*Cervus Coronatus*, Cuv.) This species is known only by a pair of horns attached to a part of the frontal, in the Museum of Paris, without indication from whence they were brought. The animal to which they belonged was evidently an adult, since they bear fourteen

* Much information on the animals of North America may be obtained by consulting the *voyageurs* who reside at Sorel or William Henry, at the mouth of the Richelieu, in Lower Canada. Several of these people have traversed immense tracts of the interior.

snags, and yet they are not a foot in length. They stand about three inches asunder, and more on the forehead than in the Elk, with five snags forward, deeply indented into the blade and the summits forked: their texture is thin and light, and they must have been borne by an animal probably not larger than the Fallow-deer. It is not impossible that this is the Kistuhé, or the Little Elk of the rocky mountain Indians, which may be an intermediate between the true Elk and the Rein-deer; this would correspond with the opinion of Baron Cuvier, lately offered on this very pair; viz., that they are the growth of a Rein-deer, an opinion which he supports by shewing several horns of rein-deer, approaching in form to these; but it does not appear that the specimens so produced belong to the European species: we believe them all American, and therefore may be of the same animal in a junior state.

THE RANGIFERINE GROUP.

The *Rein-deer*. (*Cervus Tarandus*, Lin. Caribou of Canada?) The ancients were vaguely acquainted with this animal through the accounts which they received from Scythians and Germans. They asserted that its colour changed with the objects it fixed eyes on; that it equalled the Ox in size, and had only one horn branched in many directions: but if these tales were partial misrepresentations or altogether fabulous, there is no doubt that the name *Tarandus* was Teutonic, and a mere transposition of the present, with a Latin termination. *Tarand*, *Thier-rand*, *Ranthier*, *Renthier*, offer a legitimate derivation; especially as the Greeks and Romans took the word from the mouth of barbarians, whose language was without letters, and, therefore, very irregular in pronunciation.

The adult male of this species in a wild state is the size of a stag, or even superior, but the female is less than the hind, and the tame races, particularly of Lapland, are not

much higher at the shoulder than Fallow-deer. In large males the horns are sometimes above four feet long, in the females they are constantly smaller, and the palmated parts narrower. There is, however, no species of Deer whose horns vary to such an extent; it is difficult to meet two alike. In general they are at first thrown back from the forehead, and then curve with a considerable sweep forwards. Over the face they bear each two branches, mostly palmated, but also often ending in simple points, or in several irregular processes: from the back part of the curves other snags arise, or a flattened palmed termination takes place. The figure of the animal, compared with other Deer is heavy and low, resembling a calf; the neck is short; the head carried straight forward in a line with the back; the legs short and stout, and the hoofs very broad, in large individuals not less than those of an Alderney cow, and the tail short; the hair is of two kinds, one close the other woolly; under the throat it is long, and in winter long hairs more or less whitish spread over the body. The primitive colours of the Rein seem to have been white round the mouth, horns, and shoulders, passing in a bar to the flanks, rump, under tail, and round the hoofs; at least in the domestic races, though of every colour, these marks are most usually observable. Perfectly white is common among the Wild Deer of Greenland and Siberia; across the face from eye to eye, from the shoulder-blade over the loins, and upon the anterior part of the legs, there is often a dark chocolate brown colour, and on the back the white passes to the dark by an intermixture of reddish. The belly and inside of the limbs is generally white, and the females have less of that colour than the males. The fawn has no spots on the skin, but is brownish, though sometimes white. The protuberances of the horns are visible at its birth, and in fifteen days they are an inch high. In the Russian

Rein-deer these horns grow more rapidly, and become larger than in the Swedish. The males drop theirs after the rutting season in November, but the females, if gravid, keep them till May; under other circumstances, they drop theirs at the same time with the males: the new ones are eight months growing, not being complete till August. The time of copulation is in October; the bucks groan much the same as Fallow-deer, and at this time spread a strong smell like the male goat: they cover only in the night, and parturition takes place in May. Two fawns are usually produced at a birth, and their life extends to about sixteen years. Camper discovered a membranous sack between the hyoid bone and the thyroid cartilage, communicating with the larynx under the epiglottis. This organization is not found in other Deer, nor is the use of it ascertained.

Rein-deer swim with great facility, and are so buoyant as to keep half their backs above water; their broad feet, struck with great force, impel them so fast in the strongest currents and across the broadest rivers, that a boat well manned can scarcely keep pace with them. When defending themselves, they strike downwards with the horns, but do not gore; they kick with violence, and repel the wolf with success; but their most dangerous enemy is the glutton, who is reported to drop down upon them from the branch of some tree while they are off their guard. The feet of the Rein-deer produce the same cracking noise as those of the Elk; their nictitating membrane is very moveable, and used chiefly in storms of sleet and snow: this habit, together with their scent, guides them with wonderful precision through the most dangerous passes, and in the darkest stormy nights of an arctic winter. To this sagacity the Laplander trusts his life with confidence, and accidents are of very rare occurrence. To him the Rein-deer afford a satisfactory compensation for all the riches, all the worldly comforts, which his terrible

climate forbids; while the food of the animal, consisting of the *Lichen rangiferinus*, *L. Islandicus*, and the buds of the coniferous evergreens and other arctic plants, is obtained with little trouble. The domestic Reins draw his sledge with such speed, that a pair of them, in the language of Lapland, *will change his horizon three times in the twenty-four hours*: that is they can pass three times the furthest limit in sight on starting, which in their latitudes is computed at above one hundred miles. The skin of the animal is wrought up for clothing, boots, &c.; the horns to make utensils; the sinews for thread; the flesh for food: the milk is drank fresh, or converted into cheese, and the serous part kept for drink; the bladder and the guts are also converted to use, and the tongues are usually exported.

Thus the possession of Rein-deer forms the sole riches of the Laplander, and the care of them his sole occupation. According to the season he migrates to the sea-shore, the low lands or the mountains. The rich among them often possess two thousand head, and the poorest seldom less than one hundred. In their language and dialects seventy-six different names of the animal or of its different states may be reckoned*. In a wild state they are gregarious; in a domestic they are not only gregarious, but possessed of an excessive attachment to each other. In both they implicitly follow an old male through every circumstance of danger or difficulty. The herdsman directs him by a whistle, and a look or a stamp of the foot will make the rest obey with a docility and quickness of apprehension which proves the superior degree of intelligence with which they are endowed†.

The Rein-deer suffer much in the summer months from insects, and particularly from the *Cestris Tarandi*; the

* See *Nemnich Allgemeines Polyglotten Lexicon der Natur Geschichte*, under the word *Cervus Tarandus*.

† See Mr. Bullock's interesting pamphlet on a Family of Laplanders and the Rein-deer.

hum of one of these on the wing is sufficient to alarm a whole herd, and put it to flight. This is the chief cause of the migrations to the woods and mountains, where they are more free from their annoyance: the old deer, whose hide is harder than that of the young, suffer least; and it is the yearling which of all is most exposed to the painful boring operation of the *Cæstris*, performed for the purpose of depositing its eggs under the skin of the animal. There are few wild rein-deer remaining in Lapland, but herds of them may still be seen in Dalecarlia. They exist in Spitzbergen and over the whole of Northern Russia, where the Tungusians rear a large breed, which they ride more generally than harness to the sledge. Baron Cuvier after a laborious investigation, has proved that they never extended further south than the Baltic and the northern parts of Poland.

The North American Rein-deer, or Caribou, are still very imperfectly known. There appear to be three varieties, one or more of which may actually form different species. The first is known among the Canadian voyagers as the *Caribou des Bois*, the Wood-rein; it is large, dark-coloured in summer, and presumed to be the species with flat-bladed horns, the beam being nearly vertical and unadorned with many snags*. The second resides in the dreary regions of the rocky mountains of central North America, and has been supposed to be the Mule-deer of Lewis and Clark. We suspect it to be the Kistuhé of the Kluche Indians, and perhaps the horns of *Cervus Coronatus* before described may belong to this. The third and smallest, living in the islands of the Polar Sea, Greenland, and Labrador, is the most common. Pennant and Edwards have described it, and we have a figure of the male. All are said to be whitish in winter, but the latter species most

* Since writing the above, we have met with a specimen which confirms the conjecture.

particularly so. A probable distinction by which some, if not all, the above species or varieties of Caribou, may be distinguished from those of the old continent, is that their horns are always shorter, less concave, more robust, the palms narrower, and with fewer processes than those of the former; with them, they are also said to remove the snow, as we have already stated to be done by the Original or Moose, but it does not appear that this practice has been noticed in Lapland. None of the Indian tribes of America have as yet learnt to domesticate them.

Fossil Rein-deer. (Cervus Guetardi.) To the rangiferine group must be added the bones of an animal discovered near Etampes in France, in the sand and sandstone formations. They consisted of a great quantity of fragments of horns, which assimilated much more with those of the Rein-deer than any other, but they were much smaller, very slender, almost filiform, and could only have belonged to a species not larger than the Roebuck.

THE PLATICERINE GROUP.

Next to the Rein-deer follow the animals of this genus whose horns are still palmated, but only at the summit. They form a small group, confined to one species in the existing state, but shewing in the fossil several, among which is the most gigantic of the tribe, the celebrated Fossil Elk of Iceland.

The Fallow-deer. (Cervus Dama.) The horns of the male Fallow-deer, or Buck, are divergent, terminated above by a flattened longitudinal palm, toothed with what are termed advancers; the base of the beam round, with basal and median, or brow and bezantlers pointing forward. It has no canine teeth, and the nose is terminated by a muzzle: in size it is inferior to the Common Stag. In the summer both sexes have the back flanks and thighs of a fulvous-brown colour, diversified with numerous white spots. In

winter these parts are wholly brown; the buttocks are always white, with a black streak on each side; the tail is longer than in the Stag, reaching to the houghs, black above, and white below. A dark line passes along the back; the belly, inside of the limbs, and under the throat, white; the head, neck, and outside of the legs, rufous-gray. Under the eye there is a lachrymal sinus, in other particulars there is a close resemblance to the Stag.

The first year no horns are seen on the Fawn, the second, when it is styled a *pricket*, the horns are simple dags or processes; the third two branches appear, and the palm begins to be visible, but it is the fifth before the animal is allowed by the hunter to be *a buck of the first head*; after this time they only augment in volume, and in additional *advancers* and *spillers*, or snags on the anterior and posterior parts of the palm. The species is more delicate than the Stag; they *rut* later, and their horns drop or *mew* a fortnight after his; their voice is low and broken, or what is styled *groaning*; they are more easily tamed and feed with less nicety. In the choice of locality, they prefer elevated countries and hills; when hunted, they do not flee in a direct line, but in a circle and take to the water, but without venturing to swim broad rivers as the Stag will do; hence the chase requires more attention to preserve the track.

The females or Does go with young eight months, and produce one, two, or even three fawns of a light-brown colour, with white spots. Fecundity begins in the Doe from her second year, but the faculty of procreating ends in the fifteenth, and their longevity does not exceed eighteen or nineteen years. They are gregarious, and in parks the herd sometimes divides, and repeated battles ensue for the possession of a favourite spot. Germany and France contain few Fallow-deer; in Russia and the north there are none but such as are kept in a semi-domesticated state, as is the case also in England when they are very numerous.

It is doubtful, according to Baron Cuvier, whether the species is originally European, although it is said to be found in a wild state in Lithuania, Moldavia, Greece, Persia, and even China. The spotted variety of England is likewise reported to have been brought from Bengal, where none are now known. It is not impossible that the Axis of India, China, and Persia has led to this mistake, for we find the Spotted Buck noticed in *Gwillim's Heraldry*, fourth edition, 1660, page 171, where he quotes it as borne in ancient coats of arms, and therefore anterior at least to the British intercourse with India. As the Platogna of the modern Greeks is allowed to be the Fallow-deer, it must also be admitted that it must be wild, for there are no gentlemen's parks in Turkish Europe, the grand seignor's perhaps excepted. In Spain they are reported to be nearly as large as the Stag, and in Sardinia they are numerous. Hence we may infer that in southern and central Europe Fallow-deer are indigenous. Baron Cuvier shews that the ancients have known it, but they want precision in their descriptions for us to fix the names which they applied, with unobjectionable certainty. With his usual ability and learning he points out the $\pi\rho\omicron\zeta$ of Aristotle, the Platyceros of Pliny, and the Dama of Virgil and Ovid as referrible to our animal. The word Dama usually considered as of Latin origin, may however be viewed as derived from the Celtic roots, Da, Daa, Dun, from whence our *Doe*, Dun being almost literally translated by hill, height, down. We see Ossian's heroes, hunt the Dun-deer, or deer of the hills, and to whatever date we refer these Gaelic fragments, they are anterior to modern importation. Thus also, Daa in the ancient Danish, Dam in the Teutonic, are words more naturally referred to that most ancient language of Western Europe than to the Latin: if the Romans bestowed the name, they must also have introduced the animal, for it would be singular if a species at present common from Sweden to Gibraltar, and from Ireland to Constantinople, should have

been spread by a people into countries where they never penetrated, and still more so if they had bestowed a name, questionable by their own indications yet received by barbarians, who in no other similar circumstance have condescended to borrow from their language.

As an article of food, their venison, at least in England, is far superior to that of other Deer; beside the spotted variety, there is another of a dark-brown colour, the Fawns of which have not even the spots, so common to most others. It is reported to be hardier and to have been introduced into England by King James the First, from Norway. In the British parks, these varieties have mixed, and a great diversity of shades and colours, with and without spots, have ensued, among which the white; resulting from albinism, are not uncommon.

The *Fossil Elk*. (*Cervus Giganteus*, Cuv.; *Cervus Hibernus*, Desm.) The bones of this extinct species and particularly those which form the head, determine its place in systematic arrangement in the group of Fallow-deer, and not in that of Elks. The horns often dug out of the peat mosses of Ireland, consist of a round beam, diverging more or less from the head, with proper brow and bezantlers, the extremity alone being flattened into an immense palm, furnished on both the anterior and posterior borders with long snags. They diverge sometimes nearly in a right angle from the head, spreading over a direct line of from eight to ten feet, and even more. Since a skeleton, nearly complete, and now in the Museum of Edinburgh, was discovered in a bed of marle in the Isle of Man, its affinity to the Cervi of the Fallow-deer group has been fully established, and the height of the animal, independent of its enormous horns, admitting the skeleton to be of an adult, is proved to be inferior, or at most only equal to the Elk. The horns have invariably a brow antler close to the burr, and bending over the face, sometimes bifurcated; beyond this is the bezantler

somewhat larger ; but the third or foremost of the palm is constantly the largest, measuring from eighteen to twenty-three inches ; then follows another scarcely inferior, and behind that others, often divided into two processes. On the posterior edge are one or two spillers, but we have not met with a specimen, bearing more than ten branches on each horn : heads, horns and fragments of this species have been found also in England, in Silesia, on the Rhine, in Brunswick, Cleves, France, and Lombardy. As these remains are found almost invariably in recent formations and vegetable moulds, it would be more unreasonable to deny than give our assent to the opinion of Professor Goldfuss, that the destruction of this species may be of more recent date than is commonly supposed*. His inference rests principally upon the fact of a head being discovered in 1800, on the borders of the Iss, near Emmerich in a sandy soil, at a place where urns and stone axes were also found. In Ireland the same peat mosses or bogs which contain these horns have likewise produced implements of human manufacture ; but the learned professor, searching in the earliest records of his country, points to a verse in the very ancient and celebrated poem of the *Nibelungen*, where, in the description of a hunting match, the hero Sifrid slays, according to the earliest, or St. Gall manuscript, the Urus, the Bison, the Elk, and a fourth animal, a fierce *Schelch*. This name which commentators without being able to point out in any other work a single indication, had referred to the Stag, the professor supposes to mean this species. As the ancient Teutonic names of the Elk were what they now are, Elend and Elk, and as the Elk and Stag are actually named in the verse, another beast of the chase with a name as closely allied to the former, as its bulk and horns actually assimilate with it also, may not unfairly be assumed

* The paper of Mr. Weaver in the *Phil. Trans.* of this year draws similar conclusions.

to indicate this very species; and we might add that the *Machlis* of the ancients may have designated no other*.

The *Fossil Scanian Fallow-deer* (*Cervus Paleodama*) described by Mr. Retsius in the Memoirs of the Academy of Stockholm, 1802. A horn dug out of peat ground, much larger than the common fallow-deer's, and having only one branch before the palm: it is bent more forwards, the palm proportionably narrower than in the living species, found at Svedala, in Scania.

The *Fossil Fallow-deer of Abbeville* (*Cervus Somonensis*), also larger than in the living species; the skull without peduncles, the horns rising immediately from the frontals; flattened between the brow and bezantlers, and with a greater regularity of the palm; but these distinctions are not very positive, and although the length of the horn gives one-third more than the present Fallow-deer, Baron Cuvier hesitates whether it be a different species†.

* On referring to the text these curious lines are,—

Dar nach schluch er schiere, einen *Wisent* und einen *Elch*,
Starcher *Ure* viere, und einen grimmen *Schelch*;
Sin ros in truch so balde, das ir im niht entran;
Hirze oder hinden, chunde im wenig engan.

i. e. After this he slew straight, a *Bison* and an *Elk*,
Of strong *Uri* four, and a fierce *Schelch*;
His steed carried so quickly, that none could outrun him,
Stags or *Hinds* could scarcely escape him.

Des Niebelungen Lied. durch F. H. von der Hagen. 8vo. Breslau, verse 3760. It is curious that the *Schelch* of the Germans is found to be the *Segh* of the Britons by Mr. Hibbert.

† It appears that another fossil species, together with a great variety of bones, has been discovered in the Perrier mountain; but the work which is to describe them has not as yet reached us. It was announced in November, 1824, under the title of "*Recherches sur les Corps Organisés Fossiles*," &c. par Bravard.

THE ELAPHINE GROUP.

We now come to the Stags proper, a small group composed however of species the most celebrated in the annals of the chase, and the fictions of the poets. The males have canine teeth, and three antlers on the beam, exclusive of the crown of the horns.

The Stag. (*Cervus Elaphus*.) The Stag of the European forests bears horns with a round beam slightly bent inwards at the summits, three branches pointing to the front, and the snags of the crown issuing from a common centre. The adults, male and female, in the summer, have the back, flanks, and outside of the thighs, fulvous-brown, a blackish line running along the spine, marked on each side with a row of pale fulvous spots. In winter these parts are of an uniform gray-brown; the buttocks and tail are at all times pale buff, separated from the brown by a blackish line; the head, sides of the neck, under parts of the body and legs, are gray-brown, and a broad band of brown passes down the face. All these colours become darker with age, particularly with the males. There are, however, breeds deeper in colour, who in winter are nearly black; these are most common in the German woods, the Hartz, the Ardennes, &c., and distinguished by the name of *Brandhirsch*, or burnt stag, from their colour*. Others, among which are the English, are rufous, and hence named Red-deer. Albinism likewise occurs sometimes, and was remarked even by Aristotle and Pliny. In old age they become of a gray buff colour, and there are instances also of the face being white, from whence the sign not uncommon in this country of the bald-faced stag.

* *Brand*, in the Norsk and Danish, signifies, however, the same as the French term *Entier*, i. e., not emasculated, fierce; and thence a sword was named brand.

The hair of this animal is remarkably brittle, and holds to the skin only by a *small pellicle*; his eyes have an elongated pupil, and his muzzle is very broad; the tongue is soft, and ears middle-sized and pointed. The Stag is distinguished from the Hind by his horns, the long bristly hair of his throat, and the canines in the upper jaw. The calves during the first six months are brown, spotted with white; after this period the bosses or protuberances of the horns become visible in the young males, which gradually develop two simple cylindrical knobs. During the second year the horns assume the figure of dags, or spikes, and the animal is then named a *Brocket*. The third his new horns throw out two or three tynes or snags, when he is termed a *Spayad*; and the fourth year the summit first assumes the crown, or what was anciently denominated a surroyal, then in the language of sportsmen he is a *Stag-gard*, or Stag of the fourth year; the fifth he becomes a *Stag*, and the sixth an *Hart*. From the fourth year the horns receive little alteration in their form below, excepting in bulk; but about the crown the tynes or forks augment in a variety of shapes: this description, however, refers to horns which have their regular development, without accident, for in that case they are subject to monstrosity, as in all other deer. While Germany was more wooded, and the Stag had greater abundance of food and of repose, the ramifications of the crown multiplied in some individuals to an extraordinary amount. We have sketched one in the Museum of Hesse Cassel, of twenty-eight antlers. According to Baron Cuvier there was one of sixty-six, or thirty-three antlers on each horn. This stag was killed by the first king of Prussia, in 1696, and the horns were preserved, according to Bechstein, at Moritzburg, but Wilddungen states them to have been at Königswusterhausen, in an article describing another head (perhaps of a fossil)

found near Freinwalde, in the Mark of Brandeburgh, which had, it seems, more than one hundred antlers*.

The Stag and hind had, in former times, further technical names in the vocabularies of *Venerie*. The Hart of the sixth year was an *hart of ten*: and after the seventh he was distinguished as an *hart croched, palmed, or crowned*. The Hind passed successively from the appellation of calf, to *Brocket's Sister*, and then hind, which is her third and adult state of existence.

Stags *mew* or shed their horns in the spring: the oldest first, about the end of February; the hart of ten, in March or April; and the young in May. On their losing their *attire*, they withdraw into the thickest covers until the new horns are completed, which does not occur till about August, when they begin to rub off the skin or velvet which covers them, against the stems of trees. They are able to procreate at eighteen months of age, although at that time one-third of their full growth is still wanting. The rutting season commences in September, and produces in the animal the most violent paroxysms of fury; his throat swells, he bellows, he leaves his food, forsakes his rest, traverses the country in various directions; if he meet another stag of equal age, a fierce battle ensues; they run at each other with the heads low, and with such force that sometimes the horns get entangled beyond their power of

* This learned and amiable chief forest-keeper to the Elector of Hesse; died in 1821; the work here referred to is his *Weidmans Feierabende*, 6th vol. p. 33. That Stags of this class might formerly exist in England, appears from the *Lytell Geste of Robyn Hood*.

" Yonder I see a ryght fayer hart

His tynde are so sharp, mayster
Of sixty and well mo * * *

extrication, and both die on the spot*. At this time they frequent the water's side to bathe and cool themselves, and they swim with great ease. At first the Hind flies, but is pursued and overpowered. The oldest stags *rut* first, and the season lasts about three weeks; the younger following in succession, so that the period does not terminate till the end of November. After this they are exhausted, and retire to the cover: if there be a great quantity of acorns, they are soon recovered. The Hind is gravid eight months and some days, and produces usually but one fawn or calf, in May or the beginning of June. She conceals it, and exposes herself to the pursuit of dogs to lead them from her young; the Calf remains with the Hind during the summer, and in winter the animals of all ages and sexes congregate into herds, more and more numerous as the season increases in severity. On the return of spring, the Hinds withdraw into concealment to drop their calves, and the Stags to shed their horns and regain them; the younger and the Brockets remaining together, till they part also to mew theirs.

The ancients gave the Stag a prodigious longevity; but the latest observers allow him scarce more than twenty years, which is, probably, less than his average life in those countries where he can feed and range undisturbed by man. Hinds are asserted to have been found with horns, but no well-authenticated fact places this beyond a doubt. The adult Stag is from three feet six inches to four feet high at the shoulder, and the horns seldom reach three feet in length. Mr. Pennant asserts that the Stags of Siberia

* I have seen two instances of skulls of stags entangled by the horns, and still inextricable, found in the woods, where they must have perished from inanition. I have also met with one of Elk's heads similarly locked together. It is still more frequent with the Rein-deer. Animals found in this state are named *Gusgazhiak* by the Laplanders.

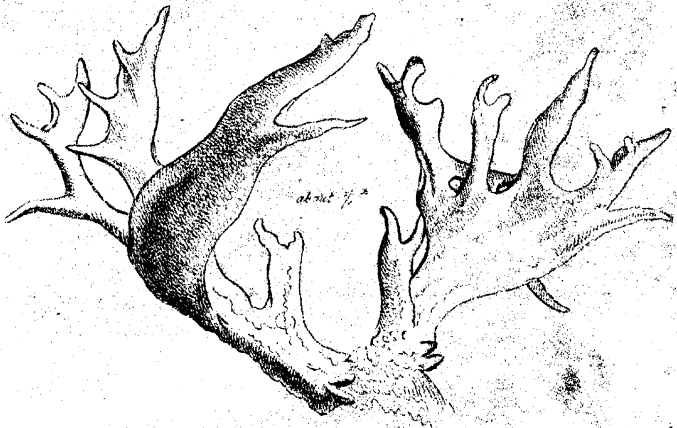
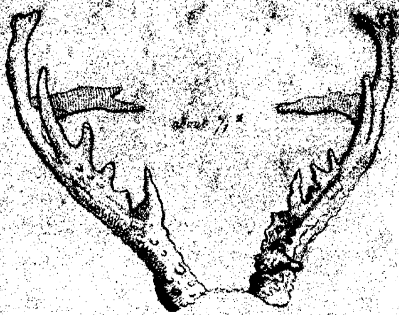
are much larger, and that the breed is not quite extinct in Europe; this appears, if in reality it be the same species as ours, from a figure of the horns published by Wildungen, to which the following dimensions are annexed:—

	Ft. Ins
Right horn in circumference of the butt . . .	0 11 $\frac{1}{2}$
Ditto of beam above brow-antler	0 7 $\frac{1}{2}$
Length from tip to butt along the curve . . .	4 0
Distance from outer tip to outer tip	5 0
Ditto between the inner tips	3 6 $\frac{1}{2}$

These dimensions in Rhineland feet and inches give a proportion of about one-fourth more than a large German Stag. The individual specimen reported not to be of the largest, was shot in 1815 on the estate of Councillor V. Radautz, in the Bukowine, and the horns were presented by him to Count Erbach-Erbach. These do not show that they belonged to an animal more than seven or eight years old, carrying only fifteen antlers in all.

The Stag is an inhabitant of every part of Europe, excepting Lapland. In England they still exist in Gloucestershire; and the North-West of Devon and Scotland breed them also. They spread over Russia and Tartary to Japan; but that of Corsica, not larger than a fallow-deer, is, if not a distinct species, certainly a permanent variety, and assimilates most with the Stag of Barbary, where the species is likewise found. Its colour is darker, legs shorter, and the antlers terminate in bifurcations only: if we may consider that fact as general, from the specimen figured in Buffon, compared with three individuals brought by an English gentleman some years ago from Barbary to this country. It is probably this animal which is figured in the Catacombs of Alexandria*.

* See the drawings of Luigi Meyer, by order of Sir Robert Ainslie. This is supposed to be the *Beheret Wash* of Shawe.



L. A. Smith, Esq. Del.

Frankfort Mus.

Notis

Staph. Mus.

Staph. Mus.

Staph. Mus.

Staph. Mus.

Under patronage of J. C. W. Smith, Esq. Del.

From the earliest periods stag-hunting was the favourite amusement of heroes, princes, and grandees. As an art it was once considered important, and termed *venerie*, because the Stag is an inhabitant of the forest, the *chase* being applied to hunting fallow-deer, roebuck, and other animals, who resort more constantly to the plain. The study of a whole life was required to learn all its technicalities, and the experience and attention of many a laborious day to distinguish the *shot* or track of the beast from that of the hind or fallow-deer, and even of the old stag or hart from the hart of ten; and then again, if the game had or had not its horns complete. All these observations were and are requisite; for to great vigour and velocity, the Stag joins no less caution and vigilance: before he quits the wood he has already carefully viewed and scented the open country; when he returns his measures are the same, taking care to enter from leeward, so as to detect, by the scent, every suspicious circumstance: before he will *arbour*, or take his rest, he will pass the spot, return direct upon his tract, and then, at a right angle, spring off to his retreat.

Men without arms, horses, or carriages, excite his curiosity more than his fears, but dogs are an object of terror to him; from them he flies at all times, and in the chase will not stop to resist them, or stand at bay, until he is exhausted or driven into the water. With all his senses very acute, his courage, when driven to resistance, is very determined. The late Duke of Cumberland exposed one, in an enclosure, to the attack of a Bengal tiger, who in vain endeavoured to bring him down: the Stag was withdrawn after a long and successful defence.

Baron Cuvier cites a great number of places where fossil remains of the Stag have been found, and among others in England, along with teeth, &c., of the Elephant, the Rhinoceros, and the Hippopotamus, as in the same caverns of

Kirkdale, so renowned for the bones of the Hyena. We possess a drawing, furnished by the Rev. Richard Hennah, of a frontal and pair of antlers, dug out at a very great depth in the Porthstream tin-work, parish of St. Austle, Cornwall: the same reverend gentleman has likewise favoured us with the loan of another horn, twenty-two inches long, with the posterior snag of the crown broken, found in the same stream, lying on the tin ground, at the depth of about seventy feet. This specimen lay among large fragments of rolled rock, trunks of trees, leaves, and hazle nuts. Horns of the Stag have also been discovered in the same peat-mosses of Ireland which contain the remains of the Fossil Elk. In the Museum of Mr. Brooks there is a magnificent pair from Ireland; they measure three feet from burr to tip in a straight line; they have bifurcations at the summit, which we see also, though on a smaller scale, in those of Cornwall, resembling, in that respect, these horns of a dubious species of North America, which we shall notice next to the Wapiti.

The *Wapiti*. (*C. Strongyloceros*.) The *Canadian Stag*. (*C. Canadensis*.) America has also its genuine Stags, but we feel constrained to place the above names together until a precise character can be assigned to separate them. Baron Cuvier, *Ossements Fossiles*, vol. iv., considers the question as decided, in consequence of his numerous and persevering researches, his comparisons of many horns and observations on the living animal. We also have made researches on this subject, both in America and in Europe, the result of which tends to confirm the decision of the great Zoologist. But notwithstanding this admission, we were always struck with the objection, that if the Canadian Stag and Wapiti were the same, how can it be reconciled to the fact, that the last mentioned, when first brought from the banks of the Missouri, should have excited astonishment, and persuaded a nation of sportsmen, such as the Americans, that it was a



THE WARRIOR

new species, when the Red-deer of Virginia must have been known to very many in the Southern States, and the Canadian was still often found in the eastern? We saw the head of one shot two years before on Long Island, and actually met the animal in his native forests about sixty miles up the river Chaudiere, and therefore on the confines of Main, where, it is true, the Canadians named him *Original*, *i. e.*, Moose. Mr. Skudder, keeper of the Museum of New York, and a sound observer, was not, however, of the general opinion; he had possessed several Wapiti from the interior. We examined one together, and he did not hesitate to consider it as the same with the Canadian. The conclusion which appears nearest the truth is that they are varieties resulting from circumstances; the Canadian animal living in deep forests and rocky mountains, the Wapiti on the Savannahs of the interior. Upon a strict comparison of them both, we find that they are about one-third larger than the Stag of Europe; but the Wapiti by the side of the Canadian is heavier in body, his legs shorter, his horns longer, the antlers more serpentine, and the lowest or brow antler more bent over the face; the beam is less pearly, and the summits, in well-grown adults, bifurcated. The Canadian appears somewhat inferior in size, proportionably higher on the legs, smaller and shorter in the trunk; his hair is much more shaggy; the horns are thicker; the antlers usually shorter, in simple curves upwards; the beam browner and more pearly; the summit trifurcated, and somewhat flattened. All these disparities may be explained by the difference of the localities which they inhabit, the forest and the plain.

It is not that the Wapiti has no winter coat when his face is covered with a woolly kind of hair, the space on the buttocks is whitish, and the back, neck, and sides, of a red-brown colour; but these colours are less intense, and the legs likewise are not so dark as the Canadians. These

trivial distinctions which may, after all, gradually merge from one into the other, serve only, we think, to establish that difference which exists in Europe, between the Stag of the Ardennes, or Brandhirsch, and the Red Stag of England. The living specimens of the animals in question require to be scrupulously examined side by side, to ground a final sentence on the subject.

The Wapiti resembles the Common Stag in nearly all his proportions, but his size is far superior, being at the shoulder from four feet four to four feet eight inches*; the superiority of bulk appearing chiefly in the magnitude of the body. The Hind is similar to the Stag with inferior proportions: the colour of both in the summer season is fulvous-brown on the back; a black spot on each side of the corners of the mouth descends on the under lip, round the eye brown, and down the face darker; the neck also is darker than the body, being mixed with a purplish-brown tint on those parts; the limbs are anteriorly dark, and lighter fawn behind. Under the throat long hairs form a sort of dewlap, also darker in colour; the buttocks and tail are pale fawn colour, separated from the brown of the thigh by a dark streak; the tail is short, but varies from two to four inches in length†. The suborbital sinus is long, open, and naked next the eye; the ears are long, lined with white hair within, and dark coloured externally. Inside of the limbs and the belly the hair is close and buff coloured.

The specimens seen in Europe appear somewhat different

* These dimensions appear superior to M. F. Cuvier's and Dr. Harlan's; but both these gentlemen give the French pounce, and not the English inch.

† This difference appears to be a probable further distinction between the two varieties. All the true Wapiti's I have seen, thirteen in number, had it very short. The Canadian, a stuffed specimen, was in bad condition, and the living gave me no opportunity to investigate this character.

in their colours from those in America, no doubt in consequence of confinement and grooming. The long hair of the throat, and also much of that on the ridge of the neck and sides dropping off. This description, derived from comparing several living specimens both in Europe and America, is the summer habit. One individual in his winter fur was of a chocolate-brown red, mixed with gray, all over the body; the neck thickly furnished with long hair, and the woolly soft fur on the forehead were sepia-brown; the chin pure white, and the buttocks and tail also nearly white.

Comparing this account with our notes taken on the spot during a winter in America, we find a stag *reported* to have been brought from the Missouri, but which in reality might have been taken in the northern districts of the States of New York, in the vicinity of the great lakes. He was three years old, four feet six inches high at the shoulder; the nose and legs sepia-black, turning on the neck and back to dun-brown; the croup and tail nearly white; the body short and thick like the trunk of an ass; the legs shaped as in a calf, very perpendicular on the fetlocks, with appearance of callosities on the knees; the croup somewhat more elevated than the withers; the neck much arched, and adorned with some long hair, the full expansion of that part not taking place till the fifth year; the muzzle broad and black; the eyes dark, and the aspect mild: the horns were greatly deformed. On the 17th of February another sketch was taken of the same animal, his horns were then beginning to shoot anew, the cicatrix of the former not quite healed, and their form resembling a flattened globe; his face was covered with woolly hair, extremely thick; on the side of the hinder legs, near the true heel, a gland imbedded in hair secreted an unctuous fluid, which seemed to cause uneasiness, and we were informed that while the horns are expanding the animal frequently rubs the points of the antlers against them; the colour of his fur was a sepia-gray, ex-

tremely slaggy. This individual was, according to Mr. Skudder, exactly similar to the specimen shot on Long Island, and might, therefore, be considered the Canadian variety; and the drawing compared with the stuffed specimen in Paris, if he be not the identical animal, closely resembles it.

The horns of this species acquire a surprising development, expanding with such rapidity that at one period their growth exceeds an inch and a half per day. The Long Island specimen of six antlers each, measured above three feet in length, and the burr and beam were exceedingly large, but in some individuals they are asserted to exceed six feet*. One specimen, of which we have a drawing, shews them nearly five feet long. The base and tertian or brow and royal antlers are invariably the longest in both the varieties; these seem to be instruments of use, for with them, when a small dead pine or a bar of a split fence sixteen or eighteen feet long lies in their way, they will lift and toss it clear over their backs.

In England, where they have propagated, it appears that some care is required for their preservation, since to an alleged neglect of this kind is ascribed the loss of no less than twelve head of the herd belonging to the king. In Canada they feed on some buds of coniferous trees and grass, and in summer on aquatic plants, which they seek under water, while sheltering themselves in that element from the bites of flies. It was in the act of feeding in this manner that we had a view of the Canadian Stag. We were in a canoe ascending the Chaudiere at a point where the river bends suddenly on opening into a small lake. A hunter among us made a warning sign for silence, and pointed *a-head*, but nothing appeared on the surface of the water; the bateau men, however, understood the sign, and grasped

* *Cuv. Oss. Fossiles*, vol. iv. p. 28.

after their muskets, but with so much precipitation and noise as to alarm the game, which now again put his head above water, and seeing the canoe, sprang forward towards the bank, with his mouth full of weeds. At this instant he was fired at, but he gained the shore very near us and dashed with elevated antlers into cover, as was thought unhurt: he appeared quite black, with large expanded horns, but no further observations could be made. We were then informed that at this period (August) they are often killed while feeding under water, but the canoe must be so placed as to glide with the current and without noise close to them, the game only raising its head to breathe from time to time, take no notice of an object which appears motionless.

On the banks of the Missouri they are said to live in small families of ten or twelve individuals, headed by an old male, who is reported to be monogamous; the rest, beside the Hind, being calves and semi-adults. The females are capable of procreating very early, one born in England having produced a calf at eighteen months old. This circumstance militates against the opinion of the Indians respecting their longevity. The males do not bellow, but when they are alarmed or excited, send forth a loud piercing whistle, to all appearance from the suborbital slit. They mew their horns in the latter days of February, or during March, and require little more than three months to recover them, notwithstanding their enormous size.

The *North-western Stag*. (*C. Occidentalis*.) It seems that a species of stag resides in the utmost western limits of North America, beyond the rocky mountains, so nearly allied to the foregoing, as to appear only a variety of *Canadensis*, or of the European *Elaphus*, or even Perrault's Canadian Stag. We are in possession of a drawing from a sketch representing this animal, made by a *Voyageur*, who stated it to be of the size of *La Biche*, with one, two, or

even three successive bifurcations at the summits of its horns*. Notwithstanding this remarkable character of the horns and the colouring of the fur, it might be taken for the Canadian species, if the collection of horns in the British Museum had not produced two pair, one of which corresponds perfectly with this drawing: this pair is inferior to the ordinary antlers of the Wapiti or Canadian, and furnishes a character likewise observable in the sketch, and which is not found in other stags, namely, that the second, or bezantler, is the longest of the three on each beam; they are about three feet from burr to tip, very rugous and pearly, the brow antlers bent over the face, the bezantler curving upwards and to the front, the royal bent somewhat laterally and upwards, and the summit terminating in two bifurcations, one above the other, and with both their processes subvertically forward. The other pair much inferior in size, probably of a four years' old animal, does not present the elegant lyrate shape of the beams, conspicuous in the drawing and in the first pair; its brow and bezantlers are conjoined at the base and point, nearly vertically, and the summit bears only a single fork with both processes upwards. There is some reason to believe that both these pair were brought to England by Captain Vancouver.

In the drawing the horns shewn to the front correspond perfectly with the first-mentioned pair. The face of the animal is coloured dark-brown, a space round the eyes and cheeks buff, the inside of the limbs and chin white, the muzzle broad and black, and the lachrymary sinus long; the ears very long, dark outside, edged with black and white

* I found the original at William Henry, on the Richelieu, and the owner stated himself to have been in the fur trade, and in this capacity to have traversed the North-western country in various directions. By the name of *Biche*, the Canadians understand, I believe, the Virginian Stag; its proper signification is the Hind. He seemed unacquainted with the Mule-deer.

within; the neck, back, flanks and hams, brown; the legs ochery, and the tail rather long and dark; a small space of the breast between the fore-legs white, but the attitude does not shew whether a white disk exists on the buttocks: the figure appears light and active. Whether the horn figured by Baron Cuvier, Plate v. No. 35, vol. iv. of *Ossements Fossiles*, can be considered as an ill-grown specimen of this species we shall not determine, nor venture to assert that this is the Mule-deer of Le Raye, or of Lewis and Clark. Should these indications be deemed sufficient to establish a species, we would submit the trivial name of *Occidentalis* *.

The *Nepaul Stag*. (*Cervus Wallichii*.) This species shews a nearer affinity with the true Stag, than the other animals of the succeeding group, by having, instead of only one basal or brow antler, two small ones at the base of each horn pointing forwards; the beam then rises in an undulating form, slightly bent back, and terminates in a point, having on the anterior face, at two-thirds of its length, a small snag or bifurcation. The only specimen known was brought by Dr. Wallich from Nepaul to Calcutta, and there figured by a native artist from the life, in the Menagerie of the Governor-general at Barrackpore: the late Mr. Duvausel transmitted the drawing to the Baron, and it has since been published by Mr. F. Cuvier. The ani-

* Le Raye's Stag, according to a MS. Journal, is described by him, "as smaller and darker than the Red Deer having *large branched horns*, the ears very large; the tail about five inches long, with short dark hair and a tuft of long black hair at the end; the inside of the limbs, belly, and mouth white." In this case the species would be found in the country of the Sioux; this description cannot well apply either to *C. Macrourus* or *C. Macrotis*; by Red Deer I presume he means *C. Virginianus*, because in speaking of the long-tailed Deer, he represents it as larger than the Red Deer, which if he meant the Wapiti, would make this an immense animal.

mal was an old Stag, so far advanced in life as to leave some doubt whether the horns are not in that state of decrepitude which accompanies old age in the deer-kind. We understood the size of the animal to be large, and the figure shews that its fur was of a yellowish-brown gray all over the body and head ; around the eyes, nose and mouth, there is much whitish gray, the mark of age ; the lachrymary slit, is long, and there is a black spot at the angle of the mouth on the lower lip ; the ears are rather short, broad, and pointed, whitish outside, and white with three blackish streaks, as in some antelopes, on the inside ; the tail is very short and, together with a large disk, spreading not below but above upon the croup, of a whitish colour ; the hair shaggy and erect ; the legs are mostly fawn colour, the hoofs black and pointed, and the fetlocks short and stout ; the horns appear to be about one and a half the length of the head, and of a whitish colour, with little indication of pearls or rugosities. We owe to the politeness of M. F. Cuvier, the means of taking a copy from the original.

By the presence of the three small antlers, the short tail and disk on the croup, this animal is placed with the true Stags, but he is intermediate, the last of this group or the first of the next : when the animal shall be better known, this question may be finally settled.

Fossil American Stag. (Cervus Americanus.) An imperfect skull and fragments of horns belonging to a large fossil species of America is described, but the genus not determined, by Mr. C. Wistar, in the *Transactions of the Philosophical Society of Philadelphia*, vol. i.—1818. In Dr. Harlan's *Fauna Americana*, it is designated by the above name, and considered as a congener of *C. Canadensis*.

THE RUSA GROUP.

This group consisting of Stags entirely Asiatic, is distinguished from all other Deer, by having round horns with



THE NEPAUL STAG
CERVUS WALLICHII Cuv.

a brow antler, but no median or bezantler, the beam terminating in a single perch, with a snag of more or less length, placed midway, or high up, on the anterior or posterior side of it. The group is further distinguished, by having in common with the true Stags, a broad muzzle, canines in the males, large suborbital openings, a rugged mane, lengthened tail, and uniform dark colours of the hair; their stature, in nearly the whole is large, and like the Stag they reside in woody places, and have a predilection for water. These characters common to several species, appear sufficient to separate them from the Spotted Axis of Belon, Pennant, and others, and to designate it by adopting the Malayan generic name of *Rusa*, for this group or sub-genus.

The *Great Rusa*. (*Cervus Hippelaphus*.) The distinctive denomination of *Hippelaphus* is applied by the Baron, to a large stag attaining it is said the size of a horse, with trifurcated horns, very coarse hair, rather a long tail, furnished with long coarse bristly hairs on the throat and neck, and with the suborbital sinus large, opening and shutting at the will of the animal. All these characters apply in a nearly equal degree to several, constituting different species, or very distinct varieties; and among them the great Zoologist quotes that described by Aristotle under the name of *Hippelaphus* or Horse Stag, "Having a mane on the withers, but the rest of the neck to the head with but little hair; it has a beard on the forepart of the throat, cloven feet, and the head armed with horns, but the female is without them; it is of the same size as the Stag, and is found in Arachosia: the horns resemble the Roebuck's." This quotation is applicable to this group in many particulars, but as it appears to us, not entirely to any one*.

The specimens from which our descriptions are taken,

* Perhaps *Cervus Pygargus*.

are the male or Stag, figured from the life in M. F. Cuvier's *Mam. Lithog.*, and which we sketched afterwards in the museum; and a male and female from Java likewise in the Museum of Paris. The distinctive character of the species appears to be trifurcated horns; the basal antler immediately upon the burr, pointing outwards and obliquely forwards; the beam at first reclining and then rising outwards and upwards, throwing off, about midway on the anterior external side, a considerable snag, which turns up and forms the terminal bifurcation. These horns are very robust and shew the similarity which exists in those now in the British Museum, quoted by the Baron from our drawing sent him by Dr. Leach; these, however, are monstrous, the brow antlers and one of the forks not being developed, and the terminal point turning forwards; they served Mr. Pennant to constitute his species of the Great Axis, and measure two feet four inches in a line, and three feet along the curve.

M. F. Cuvier expresses doubts whether the individual here noticed came from Bengal, and we are much inclined to believe that the Indian Archipelago was its native country, because the large species of stags of continental India reside above the Ghauts, and far to the northward and eastward; they are, therefore, rarely brought to the coasts, excepting as presents to the governors or men of consequence. In the Indian Archipelago they are near the coast, and more easily forwarded in a living state; but however this may be, the specimen was in size somewhat less than the European Stag. The hair coarse and hard; from the first years that of the neck, cheeks, and throat, was longer and more shaggy, forming a kind of beard, and even a mane, which he could erect like a wild boar; his winter coat was gray-brown in different shades on the neck, back, and thighs, without disk on the buttocks. In summer he was of a more fulvous-brown; the belly, lower limbs, and inside of the thighs, whitish buff, as also the

region round the orbits, cheeks, nose, and chin. He had a dark streak down the face; the ears were rather broad, with pointed tips, nearly naked within, but furnished with long white hair at the anterior side of the opening. The Baron says, *Oss. Foss.*, vol. iv. p. 41, that the buttocks are pale fawn, as in our stag; but this mark neither M. F. Cuvier's figure, *Mam. Lithog.*, in the summer coat, nor ours in the winter garb, exhibits*. The tail is dark-brown, terminated by black hairs; the breast is dark coloured, passing also along the flank; the muzzle of this species is more pointed, and the forehead less arched than in our stag. The horns augment progressively in volume as in the Spotted Axis†.

A male and female from Java likewise in the Museum of Paris, resemble the above almost completely; the female is smaller, but in other respects like the Stag. In the male the antlers are fully developed, though not quite so robust in proportion. The Stag is larger, his face darker, with a kind of band round the nose and mouth, which is white. The dark colours of the neck and back, composed of an ochery sepia-gray, extend in a list down the fore-legs, and a streak up the posterior pasterns; round the eye, ears, and cheeks, the colour is ochery-gray, and the same tones extend over the breast, belly, inside, and anterior part of the thighs and legs. The tail also is buff, terminated with a brush of long black hair.

The species has canines, and a deep suborbital opening.

* This we believe to be a mistake arising from the *Hippelaphus* being confounded with *Equinus*, which last the Baron saw alive in London, but anterior to the development of the bifurcation, and, consequently, before the specific identity could firmly be established, as we shall see when we describe that species.

† In this species the forehead is arched as in the Common Stag, and transversely depressed between the eyes. It is probable that the Persian *Gewazen* and the Arabian *Ajal* designate this species.

It inhabits Bengal, Java, Sumatra, and other great islands of the Indian Archipelago, residing in the jungle, and often on the islands in the great rivers of the country. Captain Williamson (*Oriental Field Sports*, vol. ii.) in the article HOG-DEER, speaks of a red deer with very large branching horns growing to the size of a small cow, chiefly found in the Jungleterry district, and both fierce and powerful.

The *Gona Rusa*. (*Cervus Unicolor*. Nob.) If a still stronger resemblance in the form of the horns were to have directed the name, this species might have claimed that of the Great Axis. There is, however, a difference in their being less rugged, more slender, and of a paler colour. We describe it from a drawing of the late Mr. Daniell, who says, that it is known by the name of Gona in Ceylon, and is the largest species on the island, surpassing the Stag of Europe in stature. According to the figure, the horns stand on a rather elevated pedicle, diverging from the head, with a basal antler near the burr, forming a curve forward, and the points inward of considerable length, but slender: half way up the beam, there is a short second snag, directed inwards; the ears are broad and pointed, the muzzle black and broad; there appears a smaller suborbital opening than in the former, and the forehead is covered with dark hair ending in a point between the eyes. The throat is loaded with long bristly hair, but no mane on the lower part of the neck; the tail is only a few inches long without tuft at the end; and the shoulders are more elevated than the croup. The whole animal is of an uniform dark-brown colour; the female is smaller but similarly coloured. This species resides in the Jungle and the deepest forests of Ceylon, and is said to be very bold and fierce.

The position of the second antler on the inner face of the horn, the absence of mane on the neck, and the height of

the shoulders, appear to justify its being considered as a distinct species, approaching by some of its characters to the Spotted Axis. We have applied M. Schreber's epithet, unicolor, because that author's indication will suit this better than others, he being decidedly the largest to which it is fully applicable.

In the collection of the British Museum are some horns with the second antler to the front, but of much smaller dimensions than the former. One, the skull of which is nearly complete, is remarkable for the convexity of the frontal between the horns, which rise near each other immediately from the skull without pedicle. The head measures, from between the horns to the extremity of the upper maxillary bones, about ten inches. The horns are somewhat parallel, the lower antler rising from the burr outwards and vertical: half way up the beam is the second also outwards, and obliquely to the front; they are very robust and pearly, measuring nearly two feet in length.

The next are still fixed to the facial part of the head, with the hair on, of a deep sepia-dun colour, very close and hard; the suborbital slit not determinable, but the muzzle broad and black; the horns placed on a low pedicle, diverge in the shape of a V; the lower antlers, commencing at about two inches up the beam, are placed on the anterior external side, pointing obliquely upwards and outwards. The second, near the summit of the beam, is short, and turns to the front and inwards: the whole length of the horn is twenty inches, and the distances from tip to tip about the same. This fragment was presented by Zedekiah Clark, Esq.; both are, doubtless, from the East Indies.

The Pennantian Hog-deer should be placed here, if there was not some doubt respecting the exactitude of the direction of the second antler. Baron Cuvier views it as a

diminutive species, agreeing even in colour with Hippelaphus. It may be indeed that the last-mentioned head should be referred to it, and that the height of the shoulders of two feet two inches is not inconsistent with considerable bulk of body, we having seen individuals of the spotted kind little less than the Gangetic Axis in all their dimensions, the length of the legs excepted: but, on comparing Mr. Pennant's figure with a drawing executed in India, we feel satisfied that both represent the brown variety of the Common Hog-deer, and that the error lies somewhere in the description of Mr. Pennant's specimen, which was kept by the late Lord Clive in a domesticated state.

The *Saumer* or *Black Rusa of Bengal*. (*Cervus Aristotelis*.) This is, perhaps, the largest species of the group resembling the Hippelaphus in the general character, but specifically distinguished by the second antler, commencing only near the summit of the beam, from the inner posterior part, and pointing obliquely to the rear. The burr is very broad and pearly; the first antler, strong, cylindrical, and straight, stands nearly vertically upon it, measuring ten inches in length; the beam bends from the back of it, obliquely outwards, and to the rear, and with a sweep turns its point backwards; near the summit, or at more than two-thirds of its length, is the second posterior and internal branch, short and pointing upwards. The specimen in the British Museum measures about twenty-three inches, and is very robust and rugous. The horns stand upon a short and broad pedicle; the face is straight, the nose pointed, the muzzle small, and the suborbital opening is very considerable. The ears are broad, with white hairs standing up around the orifice; the tail reaches half way down the ham, is black, and well furnished with hair. The neck and throat are covered with long, coarse, dark-brown gray hair, reaching partially over the shoulders, susceptible of being

raised like a lion's mane, when the animal is excited. The head, shoulders, back, rump, and buttocks, are dark-brown in summer, and almost black in winter; outside of the ears sepia; the belly whitish, as also a ring round the nostrils and mouth, separated from the brown by a deeper shade, which spreads up the face; the inside of the limbs and legs are fawn colour, darker over the knees down the front, and the breast black. This is the appearance of the adult stag, the hinds are much smaller and paler in colour. In the collection of drawings executed in India in the possession of M. F. Cuvier, is the figure of a *Rusa*, five years old, which lived in the Menagerie at Barrackpore.

According to the information received from friends, the male is nearly the size of the Elk, and indeed is so named in India by the British sportsmen. They represent him as excessively strong and vicious. Some of them on a shooting expedition had crossed an arm of the Jumna to a woody island in quest of game, they were on the back of an elephant, and, entering the jungle suddenly, roused an old male of this species. On seeing the elephant he started up with a loud shrill pipe or whistle, which caused others to rise and dart into cover, while he stood at bay with his bristly mane on end in a most threatening attitude, but before the sportsmen could prepare proper shot, he wheeled round and dashed through the underwood with the facility of a rhinoceros. Captain Williamson evidently met the same species. He describes the Stag as arriving at the size of a Lincolnshire cart-horse, fifteen or sixteen hands high, shining black, with tanned points (of the hair?). One of these, he says, heads a score of females, who are of a mouse colour. He too calls it an elk, and adds that they reside in the Prauss jungles.

Of the two heads in the British Museum, one bears the horns already noticed, and the frontal shews a high ridge

between the horns. There is, besides, another with the skull nearly perfect, and the horns very robust, but rather short. In the Paris Museum is one of smaller dimensions, brought from the coast of Coromandel, probably of this species, but younger, the horns being less developed.

The *Malayan Rusa*. (*Cervus Equinus*.) In the description of *Hippelaphus* the Baron refers to a specimen which he saw in London (*Oss. Foss.* vol. iv. p. 40), reported to him as coming from Bengal, and which at that period had only its first horns or brockets. It is, however, more likely that it came from the Indian Archipelago, although there is great probability that the species also resides in India. We saw this individual in the Menagerie of Mr. Cross at Exeter 'Change, and made two drawings of it, the first during the same season when M. Cuvier was in London. The animal was then about two years old, and his horns were simple, or in the brocket state; the next year its new horns shewed the bifurcation of the summit to be as in the Black Rusa of Bengal; that is, near the summit on the internal posterior side. It was then four feet or something more at the shoulder, and still higher at the croup; its eyes were large, dark, and mild: the suborbital slit opened at pleasure, and was remarkably expanded when it drank, with a perceptible action of the air passing in and out, as before noticed. The ears, broad and pointed, were nearly naked within and whitish-gray without, the face, shoulders, back, and thighs, were of a dark-brown gray; the hair rough and bristly on the neck and throat. This colour was darker, and the hair very long, especially the second year, when the crest or mane on the neck and throat hung very heavy and thick; the breast and belly were dark ashy, almost black. A considerable disk of a clear rusty, or orange colour, expanded over the buttocks, lined the inferior side of the tail, and was separated by a black line from the gray of the thighs. The tail, about a



*C. Hamilton del. Sculp.
d'après nature.*

THE MALAYAN RUSA.

C. EQUINUS. Cav.

foot in length, was black above; the joints of the legs, the inside of the thighs and their anterior side were yellowish-dun, and the legs from the joints downwards buff; the chin was white with a black spot at the corner of the mouth on the lower lip, and a bar of the same colour above the nostrils, which were placed on a black muzzle; the cheeks and space round the eyes were buff passing to gray. It had canines, and Baron Cuvier detected them likewise in the female.

The horns are of a dark colour, rugous, robust, but shorter and less curved than in the *Hippelaphus*; the anterior antler and posterior snag are both short and obtuse, but from the size of the first or brocket horns of the animal being near eight inches long, it is presumed that they become, if not much prolonged, at least very bulky: his second horns were about fourteen inches. This species resembles the Bengal Rusa in many particulars: both have the forehead flat and face straight; the muzzle small with spots of black on the under lip, and a ring round the nose; the ears naked inside; the horns short, stout, and similarly formed; the same mane and dark breast. In fact, the only obvious differences are the presence of a disk on the buttocks of the present, which does not appear on the former, and that of dimensions, but even in this particular there can be no great disparity. It may be, therefore, that ultimately these two will be marked as only varieties of one species.

The sailors and the people at Exeter 'Change, named it Jamboe and Great Water Stag, no doubt a corruption from the Javanese name *Mejangan Banjoo*. It was decidedly the same species which Sir T. S. Raffles described in the *Lin. Transactions*, under the generic name of *Rusa*. The Dutch of Java call it the Elk. Sir T. S. Raffles mentions a smaller variety of a deep-brown colour, nearly black, named *Rusa Etam* and *Rusa Kumbang* by

the Javanese, where both species are found. This smaller may be the Middle Axis of Pennant, established upon the examination of the horns in the British Museum already noticed *.

Rusa of Timor. (Cervus Peronii.) The Baron describes a head in the Paris Museum, brought from Timor by the late M. Peron. The beams of the horns are rather slender, and the posterior snag is more equal in length with the summit of the perch; these horns are of a pale-brown colour; the skull shews a longitudinal elevation of the cranium between the horns very prominent, and the posterior angle of the orbit is raised in a remarkable manner; it has canines, and the head long and pointed, but the colours of its fur are unknown. The learned author suspects this to be Pennant's Middle Axis, and the adult of the species which Dr. Blainville describes by the name of *Cervus Niger*, from a figure in a collection of Indian drawings, said to be in the British Museum, but where upon inquiry it is not found. It is probably a mistake, and that the original is in the collection at the India House. The engraved copy shews the usual fault of India drawings of deer, in the legs being too short and the figure clumsy †. Were the original without any description, we should consider it as representing a small animal of the Porcine Deer species; the horns being ill-grown, the oval form of the head, the great elevation of the croup, the absence of bristly hairs on the breast, and the form of the tail, appear to justify the conjecture.

* One or more of these species are said to be gregarious, and occasionally driven in large herds to some point or station where great numbers are slain.

† I judge this to be the case from the number of living subjects copied by myself and others, always differing in this particular from the designs of Indian artists of the very same species. I possess several in which this want of feeling, expression, and proportion, is remarkable, though the drawings are otherwise highly finished.

In this figure the horns are almost simple, the beam having only a very small antler on the front of the base, and the rest bending back, and then upwards; the colour of the face is brown-black, particularly about the eyes and mouth, and clearer under the belly, the internal face of the limbs alone being white; the tail is rather long and black. The whole appearance is in outline similar to an Indian drawing we possess of the dark Porcine Deer, and the colours are not very dissimilar: it may be a new species, for we see no indications by which it may be referred to this or the next.

Rusa of Malacca. M. F. Cuvier (*Mam. Lithog.*) represents a female from the Peninsula of Malacca of the size of the hind of Europe. Its colour is brownish-black, excepting the border of the lips, inside and base of the ears, inside of the limbs and legs, which are white; the tail is black, and broader at the point than at the base; the edge of the buttocks rust colour, and a pale streak runs across the inner angle of the eyes; but the most remarkable character is a depression above each eye, forming a sinus analagous to that of the Chamois, but which this last animal has behind the horns; the hair is hard and strong. M. F. Cuvier states, that the animal, while living in the Menagerie of Paris, was mild and perfectly tame, it would follow like a dog, and would scarcely suffer itself to be intimidated. The Baron conjectures that it might be the female of *C. Hippelaphus*, and we are inclined to view it as the Hind of *Rusa Etam* of Sir T. S. Raffles.

Rusa of the Mariannas. (*Cervus Mariannus.*) There is in the Museum of Paris, a specimen brought from the Marian Islands by Messrs. Quoy and Gaimard; it is more robust but not much taller than a roebuck, with round divergent horns standing on a low pedicle, having two antlers, the basal nearly vertical, and at its junction with the beam a small process not unlike a trilobed tooth; the

other is posterior and internal, and compared with the size of the head, the horns are large and heavy, being about thirteen inches long; their colour is ashy, and they are extremely rugged. Between the horns the skull has a longitudinal eminence, and before the orbits, near the base of the nose, are two longitudinal convexities very remarkable, and the species is destitute of canines, by which character it approaches nearer to the true Axis; the face is almost black, with a streak running down from the horns, between the eyes to the nose; the muzzle small and black, and the colour of the whole body dark-brown, slightly mixed with gray, at least such are the colours now discernible, the specimen being in a bad state of preservation; the tail is about four inches long and black.

A fawn brought from the same island in the above museum is fulvous-brown without spots; the throat is whitish, a white spot at the end of the lower jaw, and one at the base of the ear. The inside and anterior border of the thighs and buttocks are white, and the legs buff.

From the similarity of structure in the skull there is a probability that the same species inhabits Manilla; the markings and colours being also nearly the same, only that in this, canines appear, which the other seems to be always without.*

THE AXINE GOAT.

Although the true Axines have horns of a similar form with the Ruas, their structure is more slender and less rugous. The animals themselves are small, the largest not exceeding the Fallow-deer; they are without canines, and their fur is mostly spotted with white. The ancients knew

* It appears that Baron Cuvier has distinguished one of this group by the name of *Cervus Danausella*, but I do not find which, unless a new species should have been established by him since the publication of his *Observations* of 1823.



*Chas. Smith Esq.
del. Pitts Mass*

RUSA OF THE MARIANNA.

C. MARIANNUS. Dorr

two species of ruminants with spots, inhabiting the East, the Axis and the Jorcos. It appears probable that by the first they understood the same animal as modern Zoologists; but the second is more doubtful. The most obvious application would have been to the Hog-deer of the moderns, if it were not improbable that the trifling distinctions between this and the Axis had been noticed by the ancients: we may therefore suspect that by the Jorkos they understood the Jasin or Antelope, which, although not exactly spotted, is often agreeably diversified with fulvous black and white; and that this supposition is not quite fanciful, appears from the *Institutes of Menu*, where the Jasi or Antelope is repeatedly mentioned as spotted, which phrase is used also in other Indoo codes, and the animal itself portrayed.

The *Spotted Axis*. (*Cervus Axis*.) This species nearly resembles the Fallow-deer, but is readily distinguished from it by the round horns without a terminal palm; they stand nearly vertically, with a slight bend forwards, the points approaching each other; at the base an antler arises from the front, and is pointed forwards; another half way up the beam on the internal side is turned to the rear. There appears no suborbital opening, and, as we have said, the canines are wanting in the jaw; the muzzle is black. These characters are constant; but to distinguish the female from the doe of Fallow-deer, or the males, when destitute of horns, from each other, is more difficult.

From the accurate comparisons of M. F. Cuvier, it results that both have the back, shoulders, flanks, and thighs, of a fulvous colour, spotted with white. On the buttocks of both and along the sides there is a white line, but pure in the Axis, more yellowish in the Fallow-deer; a dark-brown line runs along the back of both, but darkest in the Axis, and covered with white spots; while in the Fallow-deer the line is paler, and the spots range only along its

border. The Fallow-deer have the head pale brownish-gray; the Axis bears a dark spot on the forehead, and a blackish-brown line down the face. Fallow-deer have the buttocks of a pure white, marked on each side with a black line, and the tail, black above, is white below; the Axis shews no white on the buttocks, the fulvous of the thigh extending over that space, and the tail itself is of the same colour, with only a part dark towards the tip; the belly and interior of the thighs are white, and the rest of the limbs pale-brown; the convex part of the ear is brown-gray, and the internal border black. But the Axis, although he sheds his hair, does not, like the Fallow-deer, change his colour; his muzzle is broader, and the head thicker and longer. But these distinctions are not constant in all the varieties and breeds.

The Dacca districts and Rohilla country replete with forests, seem to produce the large fulvous varieties with two rows of oval white spots on the back, and with higher shoulders than the smaller, which are the true Hog-deer of Indian sportsmen on the Cosimbazar Island, in the Jungleterry and the Bahar. Some of the latter have the belly of the colour of the flanks, a sort of mouse colour, with a full white streak along the side, and two large oval white spots on each side of the tail, which is also shorter than in other varieties. In the forests of Ceylon they are also large, straight-backed like a cow, without the oval rows and chocolate streak on the back, and the face is wholly buff, with the nose rather prolonged.

The female is larger than the doe, and her head somewhat longer; the male is about the size of the Fallow-deer; the fawns are marked with spots like the adults. In their habits they are gregarious and pacific, the males living peaceably with the females *. The voice of the Axis is a

* M. F. Cuvier mentions a singular habit in a female of twisting the neck upwards, somewhat like the Wryneck, without any

kind of barking, not unlike the voice of the Stag, and his manners are also similar. In India all the varieties are known by the general name of Hog-deer, and called in the Moorish language used in the country, *Parrah*. They are found most usually in the heavy grass jungles in the lower provinces, and to the northward in the *Jow* and *Surpact* jungles along the banks of the rivers; they feed in preference on the silky grass, used for making twine, called *Moonge*, if it be found near some heavy covers where they breed, and from whence the female leads her fawns in twelve or fifteen days after birth. They are extremely indolent, feeding at night, and passing most of the day in sleep; and, perhaps, on that account they are averse to, and will not remain in the vicinity of, Wild Pea-fowl. They are fleet for a short distance. The doe is seldom seen in an advanced state of pregnancy, keeping at that time in the cover, and the bucks are then very vigilant and fierce in their defence.

The Spotted Porcine Axis is a smaller variety, with a shorter head, and still shorter legs. Their horns are very slender, and the branches only short processes. In the colouring of their fur the white spots are smaller and more irregularly disposed, and the forehead is without the dark central spot. The cross breed between the large and smaller varieties partakes of both, having the large body with the regular row of oval spots and some marks on the face, as in the former, and the short fore-legs, elevated croup, shorter head, and slender horns of the latter. It is asserted that the Axis and Fallow-doe have bred in England.

The *Brown Porcine Axis*. (*Cervus Porcinus*.) It is a question whether this be a variety or a species; if there be no error in Mr. Pennant's description of Lord Clive's speci-

seeming cause, but we have never observed it in others, and believe the present instance to have arisen from a private cause not attributable to the species.

men, Baron Cuvier's judgment would decide it a species, from the circumstance alone of the superior antler being anterior and external: but the drawings of this animal, executed by Indian artists, which we have seen, shew no characteristic difference in the horns, though in other respects they resemble Pennant's figure, and therefore our doubts still remain. In these drawings the horns are very slender, about a foot long, very distant at the base. They are parallel with the face, slightly bent, with a small process at the anterior side of the beam, and a very diminutive bifurcation turned *inwards* at the summit. The head is oval, the muzzle small, measuring altogether about eight inches in length: the ears short, round, naked, and rose-coloured inside, with a few white hairs at the orifice; the body from nose to tail is above three feet long; the shoulders more than two feet from the ground, and the croup something higher; the neck, back, shoulders, flanks, and croup, are fulvous-brown; the face, and a ring surrounding a buff-coloured border round the eyes, are pale gray; the cheeks fawn colour; under jaw and throat white; the tail rather long, is brown above and white beneath; the body is thick and clumsy, but the legs fair and slender, of a buff colour, with some white on the inner side of the thighs and fore arm*. The animal is rare.

Dwarf Axis? (Cervus Pumilio? Nob.) A fragment of a frontal, not above three inches broad across the horns, preserved in the Royal College of Surgeons, London, may be a very diminutive species of this group. The pedicles are low, supporting a pair of whitish miniature antlers, with a slightly-pearled burr at base, above which rises a smooth vertical process, little more than an inch high. On the right horn this commences near the base, on the left three-fourths of an inch above it; the beam recedes slightly, and

* Measured from a skin without horns.

assumes the form of a flattened spike about two inches high, ending in a point; between the process at the base and the beam, the horn is compressed as if hollowed out; the animal to which this fragment belonged, cannot have exceeded the smallest antelopes by more than an inch or two. If this should be a species, we would name it Dwarf Axis, *Cervus Purtilio*.

THE CAPREOLINE GROUP.

The horns of the Capreoline group, in general, are a diminutive representation of those borne by the Ruses of the Mariannas and Moluccas; but the animals are shorter and more elevated on the legs, they are destitute of tail, and have no lachrymary sinus. In general, the horns developing, as in the rest of the genus, from a first pricket to a second, with antlers, and these in their turn enlarging with age. The complete form, however, consists in having only two antlers, or rather processes, the inferior forwards, and the superior to the rear, which, with the point, make three; but occasionally tubercles swell into processes, and then they seem to have four or more. Indeed, the Roebuck group is more subject to diversity of horn than any other deer, the Rein excepted, probably from their residing much in underwood, which being apt to inflict wounds while the horn is tender, produces diseased and monstrous formations. There is in the Museum of Berlin, a specimen whose horns are without lower antlers, but the summits are flattened with four processes on the one, and seven on the other horn, yet so regular, that, taken by themselves, they would appear as belonging to an unknown species. There are, besides, others diseased, where all the processes are uncinated, and we have seen one in which the pair united into a globular mass, nearly as large as the head.

The Roebuck group belongs exclusively to the Old World.

and is represented in the new by the Cariacou-deer, and by the Broockets of South America.

The *Ahu* or *Tartarian Roe*. (*Cervus Pygargus*.) Although this animal must be considerably larger than the Roebuck of Europe, and the great expanse, solidity, and ramifications of the horns, produce a very different aspect, yet their character is fundamentally the same: this affinity is further supported by the absence of tail and of lacrymary sinus. Pallas and Gmelin have both described the *Ahu*, no doubt from the name in the Tartar dialects, and even in the Persian, being generic: the latter, in particular, seems to have known only a variety of the Roebuck; but the former, although we learn from the Baron, that ultimately he too viewed his *Pygargus* as a mere variety, described nevertheless the true species of *Pygargus*, but in its junior state.

According to Pallas the *Pygargus* is a native of Hircania, Russia, and Siberia, inhabiting the loftiest regions, and descending in winter to the plains. In form it resembles the Roebuck, but is larger. Its colour is brown, with the under parts of the body yellowish: the hinder parts of the thighs are white, forming a large disk on the buttocks; the space round the nose and sides of the lower lip are black; the lips themselves white. In winter the fur assumes a hoary appearance: the ears are lined with short white hair, and the orbits surrounded with long black hairs. The whole coat of the animal is excessively thick, and in the spring grows remarkably rough and erect. It has no tail but a mere cutaneous excrecence. Of the horns he says, merely that they are strongly tuberculated at the base: but, referring to his figure, we find them broad with the inferior snag high upon the beam and much developed, and the posterior bending down in the form of a hook: he omits also the dark tips of the ears, and the streaks on their inside. So far the presumption that the

animal in question is only a large variety of the common might be maintained, notwithstanding several minor indications of diversity of species.

But we found in the Museum of Prague, in Bohemia, a remarkable pair of horns, presented to that establishment, as we were informed, by a Polish nobleman, who brought them from Russia, and said that they were of the Roebuck of Tartary. We observed another pair perfectly similar in the Museum of Frankfort, where they were considered as belonging to a roebuck. These came out of the collection of deer's horns of some nobleman in the vicinity without indication. It was, however, admitted, that no frontal much inferior to the Stag's could afford room for their burrs, and, therefore, that the Roebuck was too small for them. These two pair shewed the base of the horn subvertical, reclining backwards and outwards, very rugous, tuberculated, and pearly, some rising nearly an inch high. The anterior antler commences where the beam curves back; it is vertical with several processes beneath. The beam then bends outwards, and terminates into a bifurcation, the anterior being dichotomous, and the posterior turning horizontally inwards, so as nearly to meet its fellow from the opposite horn, the termination being forked also. They were of a deep-brown colour, and measured between thirteen and fourteen inches from burr to tip. The diameter across the base of both horns and the frontal about five inches.

These specimens established the existence in northern Asia of a species of buck superior to the Roe of Europe, and even to the Fallow-deer, and which cannot be referred to any known species excepting the *Pygargus* of Pallas, whose figure in that case must represent the Buck of at most the fourth year. In turning over a series of Indian drawings of plants, insects, and animals, in a printseller's shop, we found a representation of the animal, which we

think establishes the identity. In this figure the ears are whitish both within and on the outside, with three dark streaks, as in the Antelope, on their inner surface, a large white disk on the buttocks, and only a rudiment of tail. The horns exhibit the same characters as the preceding, and the animal appears more robust and shorter on the legs than the Roebuck. There is also a slight indication of a fold below the eyes; the colour of the coat is a rufous brown; the legs and face dun. By this drawing, the work of a native artist, it would appear that the species extends to the southward, probably to the foot of the great chain of mountains where Captain Williamson found the Roebuck, which from his account would seem to be the common species*.

The *Roebuck*. (*Cervus Capreolus*.) The Roebuck is the smallest of European Deer, not above four feet long, and two feet eight inches at the shoulder. There are two varieties of colour, one very red, and the other yellowish-brown gray: there is even a third nearly black in the Duchy of Luneburg, in Hanover; but all have a white disk upon the buttocks round the insertion of the tail, which is only one inch long, and does not protrude beyond the hair. In summer, however, the disk is totally or partially obliterated; the hair is then softer, and the head and neck slightly mixed with gray: in winter the fur is closer and darker; on the back and neck also the colour is deeper than below; the muzzle, which is small, is surrounded with deep brown, leaving two white spots on the upper lips, and one on the lower. The species is destitute of canines and lachrymary sinus: with the exception of the horns, the female is like the male, and the fawn is spotted with white. In the second year the young buck bears prickets, and the third a small antler is seen on the front of the beam, after-

* General Hardwick has lately given an account of the *Cervus Pygargus* to the Linnæan Society, but the paper is not published.

wards a second antler points backwards, somewhat higher than the first, and forms a fork.

The Roebuck is extremely graceful, active, and even daring; his eye is fine and full, and his limbs remarkably pliant; he is cleanly, leaps with great vigour, and resides in preference on elevated ground, not so much in the forest as on its borders, and in coppice; he leaves a strong scent, and is thus more exposed to the pursuit of dogs; but his instinct is more fertile in resources, which he employs the moment he is hunted, without previously exhausting his strength in a prolonged course: he begins, after a first dash forward, by doubling over his track, to mislead the hounds, and then, by some great bounds, he springs off towards a cover, where he lies down to let the chase pass. His manners differ likewise from the Stags; for he remains attached to one female, who produces usually two fawns, one of each sex: these, when grown up, pair off together. The Bucks rut in the beginning of November, when the young of the family are for a time driven off, not to return again until they are full grown. Gestation lasts five months, and the female withdraws into the closest cover to drop her fawns, and re-appears in about twelve days with them in company. If there happen to be danger, she conceals them, and then advances to meet it, exposing herself to attract the attention of the enemy. The Buck mews his horns after the rutting period, and recovers the new during winter. They live from twelve to fifteen years; but many perish in severe seasons. The venison of adults is not much esteemed, though the brown variety is said to be superior in that respect to the red.

Roebucks are found over all Europe, and part of Asia. There are now very few in England, but still a sufficient number in Scotland. They are delicate in their food, and pick the buds and small shoots of several kind of trees

in preference to grazing, and thereby commit some damage in the forest. No art can completely tame them, their distrust remains invincible. Mr. Bewick relates a remarkable anecdote of one, which, being hunted out of Scotland, through Cumberland, and various parts of the north of England, at last took refuge in the woody recesses bordering on the Tyne. It was repeatedly seen and hunted, but no dogs were equal to its speed: it frequently swam the river, and, either by swiftness or artifice, eluded all pursuers. It happened during the rigour of a severe winter, that being pursued, it crossed the river upon the ice with some difficulty, and being much strained by its violent exertions, was taken alive. It was kept for some weeks in the house, and was then again turned out, but all its cunning and activity were gone; it seemed to have forgotten the places of its former retreat, and after running some time, it lay down in the midst of a brook, where it was killed by the dogs.

According to Captain Williamson a species or variety of Roebuck exists in India. He says that "The Roebuck is not unknown in Bengal, but is only found on the borders, particularly along the western frontier among the crags and ravines. It is found in elevated situations, but in general is extremely shy, and frequents such covers as are divided into small patches. They do not grow near so large as I have seen them in Scotland."

The Fossil Roebuck. Horns and fragments of a species of Deer which appears to belong to this group, have been found in calcareous marle in the environs of Orleans, with fragments of *Paleotherium* and *Mastodon*, and in the peat earth of the Somme, in France. The latter are decidedly of the true Roebuck, but there is a difference in the teeth of the upper jaw of the former sufficiently marked to distinguish them specifically and almost generically from the whole genus, and approaching, especially by the two first

molars, to the Musks, and thereby proving a further affinity in the two genera of the family.

THE MAZAMINE GROUP.

The next group of Deer composed exclusively of American animals, appears to be that to which the generic term of Mazatl or Mazame (including indeed other ruminants) was bestowed by the aboriginal nations speaking the dialects of Mexico, or the Toltecan and Astecan languages ; they are distinguished from other Deer by having in general smaller horns, with a tendency to flatten, bending more or less into segments of a circle, the concave part to the front ; with only one anterior antler, and the others either posterior or vertical. Their tails are longer than the preceding, the heads longer and finer, and they are furnished with a brush of erect hairs on the inner face of the hinder joint ; they have a small suborbital pore, appearing like a simple fold of the skin ; a muzzle, but no canines ; their eyes are large, prominent, and soft, and the ears in general long. It is as yet a question, whether the specimens here described constitute in reality different species : to admit them all as such, would, perhaps, militate against precision, as it cannot be denied that several exceed the proper limits which should guide us in this difficult genus, where trivial and external characters are necessarily the only criterion.

Virginian Deer. (*Cervus Virginianus*.) The Virginian Deer forms the most prominent species of the group, and serves for a type of the others. It is about three feet three inches at the shoulder ; light and elegant of form, with a long tapering nose ; the horns reclined on the head turn outwards, and then with a very decided curve, point their extremities forwards ; the burr is small, and near it, on the internal side of the beam, rises a single short antler, inclining inwards in the direction of the

beam ; the first horn is only a simple pricket ; this is succeeded by a fork on the summit ; then two and three snags on the posterior part of the curved beam, pointing upwards, which is a mark of the fifth year. In old animals the superior part of the beam flattens, and the snags and point become dichotomous ; while the burr having widened considerably and increased the length of the brow antler, throws up spurious collateral shoots round the base. Measured along the curve, the horns scarcely exceed twenty-five inches in length : they sometimes vary, so that in the fourth year only simple prickets about seven inches long are thrown out ; which malformation has given rise to a supposed Deer with single horns, known in the United States as the Spring Buck of the Jerseys*.

In summer the coat of the male and female, is of a bright fulvous cinamon colour, changing into a fine brown-gray in winter, the hairs being then annulated with brown and buff ; the belly, inside of the thighs, the internal face of the fore-legs, above the knees, and the posterior inner border of the buttocks, are white ; the throat, breast, and under part of the tail of the same colour ; the upper part of the tail is dark, and the legs fawn colour ; the ears are long and pointed, outside of a brown gray, inside well lined with white hair ; the forehead, face, and cheeks, brown, with a slight mixture of gray ; round the eyes, lips, and chin, fawn colour ; the muzzle small and black, no spot on the corner of the mouth, but the winter hair of the belly, and under part of tail long and silky, and the bristles on the inside of the hinder joint, or tibiotarsal articulation of a deep rust colour : in this animal the eyes are peculiarly bright, soft, and beautiful.

This species exemplified from an individual of uncommon

* The horns of one in the Museum of Philadelphia, correspond exactly with Cuvier's figure 10, pl. 5 of vol. iv. *Ossements Fossiles*.

beauty, sketched at New York, was in the fifth year of his age; the horns were smaller than the specimen figured by M. F. Cuvier, the snags more slender and developed; and on the croup were two crescents marked by the friction of the horns on those parts, from some habit in the animal.

The fawn is of a lively fulvous-brown, marked during the first year with numerous white spots. They rut in November and December, when the neck of the Buck swells, and gestation lasts near nine months, the females dropping two or even three fawns. The Bucks lose their attire about the same period as the Stags of Europe; they bray but with less noise, and live in herds from the southern confines of the great lakes and the St. Lawrence to the Floridas, and westward, in the interior to an immense distance. According to Professor Harlan, this species displays great enmity towards the Rattlesnake, which it contrives to crush, by leaping, with the fore-feet conjoined, and dropping perpendicularly on the serpent, bounding away again with great lightness, and repeating this attack till the enemy is killed.

Dr. Say notices a variety found at Engineer's cantonment in the interior of North America, marked with a white triangle on the front of all the feet, the point upwards, and a black mark on the lower lip strongly characterized, and not so far back as the angle of the mouth as in the former: its dimensions are somewhat less, and the weight one hundred and fifteen pounds.

The Virginian Deer appears to be Lawson's Fallow-deer, and sometimes the Red-deer of the United States, though Mr. Warden applies this name to the Wapiti. The skin is used for gloves, and the native Indians of the interior dress them in an excellent manner to make leggings, jackets, and mukissons. It appears also by the mummies dug out of the saltpetre caves of the interior, that anciently they wrapped their dead in them.

Mexican Deer. (*Cervus Mexicanus*.) This species not as yet figured, was first noticed by Mr. Pennant, who represented the horns, (*Hist. of Quadrup.* p. i. xx., fig. i.) from a pair in the Museum of the Royal Society and now in the British, to which the ticket of *Mexican* was attached. With this information he inferred it to belong to Hernandez's *Tenillo Maçame*, and Dr. Shaw says "that it is about the size of a common roebuck, and of a reddish colour, but when young is often spotted with white; the horns are thick, strong and rugged, they bend forwards and are about ten inches long, and trifurcated on the upper part, but they sometimes vary in the number of branches or processes; the head is large, the eyes large and bright, and the neck thick." That author next describes what he supposes a variety, from a pair of horns, styled by Grew, horns of the Indian Roebuck; this is probably the pair still in the British Museum, of which the following is a description: they are of a bright yellow colour, so irregularly and widely palmated as to cause a suspicion, that they once belonged to an unknown species of Reiu-deer, or to a second species of Elk; they are nearly seventeen inches long, spreading diagonally from the head and reclining back; there is *no burr* at the base, only a broad, ascending, tuberculated, and toothed beam. At two inches from the base an antler issues from the anterior part in a vertical direction, flat and ending in two points: about three inches higher the beam, being somewhat prismatic in form, widens, and a broad flat branch throws up four snags in the form of a palm, the foremost plain, the next toothed, the third plain, and the fourth bifurcated: behind these a fifth assumes a still more singular form, it ascends in the same direction with the others, terminating in three processes, and from its external posterior side throws out an horizontal branch which bifurcates again, the inferior being the longest and hanging downwards, this is the right horn: the left, after the basal

antler, throws obliquely forwards a flat broad branch dividing into two processes, then vertically one with three external processes, and then a third likewise with three external processes, but these three branches flatten also at base into a kind of palm obliquely facing the other*.

M. F. Cuvier describes the horns as strongly curved forwards, spreading outwards, and converging towards each other at the extremities: an antler at the anterior face of the beam, pointing vertically and furnished with strong denticulations; a spiller or antler at the posterior part of the beam, divided into several small branches: these horns flatten into a sort of palm from the second antler, and at their base are deeply grooved and strongly tuberculated. The head in the possession of the describer, was very adult, and had a muzzle but no canines, which forms a further indication of affinity with *C. Virginianus*†. From these descriptions, and the figure in Pennant, and in *Oss. Fossiles*, vol. iv, pl. v. fig. 23 of Baron Cuvier, it is evident, that if the species be the same, there is a very great difference in the development of the horns, and that the name of Mexican as applicable in particular to the palmated pair, is very problematical. There is, indeed, some suspicion that they belong to a deer of the cold extremity of South America; for although we still find an indication of affinity with the Virginian Deer, it is through a succession of gradations, the extremes of which have no longer the appearance of a common original type.

* I find on my sketch the words *Cervus Mexicanus*, but doubt whether they were subjoined from any written ticket attached to the horns themselves; they appear to belong to *Cervus Ramosicornis* of Blainville.

† On referring to fig. 23, pl. v., vol. iv. *Oss. Fossiles*, it is plain that these horns are far inferior, and very different from the pair before described, and leave little doubt of their being of different species.

Before the publication of the last-mentioned work of the Baron's, in which this transition is depicted, we had made constant researches in museums, and among others in that of the Royal College of Surgeons, the British, the Leverian, Mr. Bullock's, and Mr. Brooks's. In the collection of the last-mentioned gentleman we found another pair of a bright golden-yellow colour, very robust, rising from the burr with strong pearls, and a small antler in front: behind this, and in contact with it, a second snag, strong, vertical, notched, and grooved; the beam then bends out at an angle, horizontally and laterally, and then curves forward. On the superior edge, are three bifurcated snags, two vertical, and the third bent forwards; at the extremity are two simple, both pointing forwards; but what seems to confer a decisive character on these horns is, that beneath these, on the inferior edge of the beam, a sixth heavy snag hangs down perpendicularly, widened and flattened at the base, and evidently much worn by friction, while the animal grazes: this is the character on the left; the right is similar, excepting the extreme points which appear to have been injured in the development. In the British Museum, there is another similar pair with the worn clavate suspensal snags, but less in proportion*. These two specimens seemed to justify the appellation of *Cervus Clavatus* for a new species, but the comparison of several others in the British Museum, evidently of the same character as figures 8, 9, 23, of plate v. before cited, would leave a doubt did any one exhibit the inferior clavate snag. Fig. 16 indeed has something of the kind, but comparing the two figures their resemblance is very remote, though it might possibly be of a young specimen of this supposed

* The notes of dimensions being mislaid, I cannot give them exactly, but the proportions of the drawing offer about two feet to each horn measuring along the curve, and about three feet six inches from tip to tip, in a line to the extremities.

species*. The above specific denomination may therefore be still proposed, and as we have shewn, there are in this article, perhaps, altogether three species indicated; or we must assume, that the Virginian or Mazame group, although it consist of one species only, has, nevertheless, a most extensive variety of forms in the very parts of the horns where specifical distinctions are allowed to reside.

Great-eared Deer. (*Cervus Macrotis.*) This animal which may be the younger state of one of the preceding, is described by Dr. Say, as light reddish-brown above; the sides of the nose and upper portion of the forepart of the nose dull cinereous; the back intermixed with blackish tipped hairs, which form a distinct line on the neck near the head; tail reddish-cinereous black at tip; this part is somewhat compressed, and almost naked beneath: the hoofs are shorter and wider than those of the Virginian Deer, and more like those of the Wapiti; the horns slightly grooved and tuberculated at base, with a similar antler as in the Virginian; the beam less curved forwards, is bifurcated equally at about seven inches from the burr, and each bifurcation near the summit again divided, the anterior of the second bifurcation being somewhat longer than the posterior; the ears very long, extend to the principal bifurcation, about half the length of the whole horn; the lateral incisor teeth are larger in proportion to the intermediate than in the Virginian; eye-lashes black; lachrymal apertures also larger, and the hair coarser, and undulated and compressed like that of the Wapiti†. The species is

* When my drawings were made, I had no knowledge of the method adopted in the *Ossements Fossiles*, or I would have designed my figures in a similar point of view.

† This account taken from Dr. Harlan's *Fauna Americana*, says Elk in this citation, but as that word is by him applied to Wapiti, we presume it is the animal here meant. It is to be regretted that the accurate Dr. Say has not published figures of the horns.

found in the most remote north-western territories of the United States, and from the context of this description it appears evident, that the Guazupuco Deer is nearest allied to it, and that the Guazuti and the Virginian are clearly of the same group.

Long-tailed Deer. (*Cervus Macrourus.*) Also named Black-tailed Deer, and deer with a large tail, from the peculiar large size and contrasted colours of that organ. This animal is described in Le Raye's MS. Journal, as larger than the Red-deer, of a darker colour, with a white belly; the horns short, small, somewhat flattened; the tail nearly eighteen inches long, black above, with broad white edges, and held up erect while running. It abounds about the Kansas river in Central North America.

Guazupuco Deer. (*Cervus Paludosus.*) This animal is described by M. D'Azara as having horns rather large and cylindrical, terminated by a fork, with an anterior antler some way up the beam, simple or bifurcated, pointing forwards, and then vertical; his muzzle is large, figured like that of an ox; the eyes large and full, with a lachrymal fold beneath; the forehead below the horns flat; the ears terminating in a point; the pedicles of the horns are one inch high, and the horns about one foot four inches in length, with never more than five snags; maminae four, disposed in a quadrangle; the eye-lashes black, surrounded with white, which passes on the side of the face, and surrounds the muzzle and mouth; a black velvety spot in the angle of the lower lip, another facing the nose on the upper; a black triangular one on the nose, and another between the eyes, united by a dark line between them. Inside of the ears, under-jaw, and cheek, white; a black spot on the interval of the hoofs of all the feet, ascending to the second joint; a black band passing along the breast, and on the under (upper) part of the tail. In size this animal is at least equal to the Stag of Europe, being four feet at the shoul-



A. Hamilton Esq. del. & sculp.

T. Lind.

GUADALUPE DEER.

***C. PALUDOSUS* Desm.**

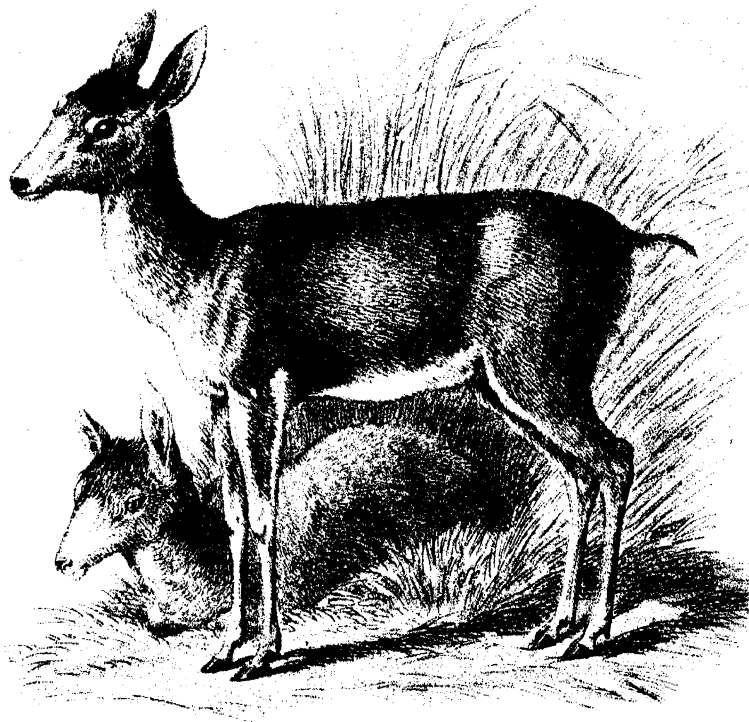
side of the nostrils so as to widen this part into a glandulous appearance: there is a suborbital sinus before the eye, and the male has canines; the horns are always simple with a small burr at base, and the pricket about five inches long; the body is of a lively reddish-bay, excepting the face and feet, which are red-brown; the lips, chin, surface between the under jaws, under part of the tail, and lower abdomen, are white; the throat and internal face of the thighs whitish-gray; the tail with the hair is nearly nine inches long, and red-bay above; a circle round the eyes is occasionally paler than the rest of the head: the females have the same colours, but are smaller in stature. The species resides in the deep forests of the level parts of eastern South America, along the bay of Honduras, and the neighbouring countries: they live in large herds, and appear to be the only gregarious ruminants known who do not prefer the plain.

The *Apara Brocket*. (*Cervus Simplicicornis*. Nob.) There is a second species of red Pricket-deer very like the foregoing, but six inches lower at the shoulder, and it is believed destitute of canines. The colours are the same, but brighter, the tail shorter, and the hair upon it longer; round the eyes there is a ring of darkish colour, and a dusky mark on the mouth. Baron Cuvier (*Oss. Fossiles*) first indicated it as a separate species, and Laborde seems to point it out in his second or smaller *Biche des Bois*, the above being designated by him as the *Biche de Barcollou*. This appears to be the species in the Museum of Prince Maximilian of Nuied, to whose politeness we owe the drawing of both sexes. Messrs. St. Hilaire and Lalande have likewise brought a specimen from Brazil. There is also little doubt that so early as the time of Maregrave and Piso, who were both in the suit of Prince John of Nassau during his campaigns in northern Brazil, this species was observed by them under the name of Cuguazu Apará; but,

having omitted to give a figure, and substituted instead one of the Stag of Europe, naturalists were unable to comprehend them. Fortunately the original collection of the drawings made by the Prince of Nassau, or by his orders, with MS. notes in his hand, and in that of both the above naturalists, is still in the Berlin Library, and there we find a good representation of the female in a nearly adult state. The colours are the same, excepting that the ears are nearly transparent, and the head and neck dark ashy, with a little white on the throat. This ashy tone we found still about the eyes of the adults, and we infer that this colour disappears from the head and neck when the animal is full grown. It is probable that this species resides more in the uplands, and in more open ground*.

The *Bira Brocket*. (*Cervus Nemorivagus*.) This species has been confounded with the preceding, though it is still smaller, being only eighteen inches at the shoulder, and the aspect and colours of the animal are very different. Azara describes it as having the head more like a lamb; the tip of the ear is rather round, lachrymary sinus very small; the horns straight, reclined, smooth, solid, and pointed, having a diameter of seven lines, and one or two inches in length; the coat is of a gray-brown, the hair being brown with yellowish-white points; some white on the breast, lips, and chin; the belly, interior as well as anterior and posterior part of the fore-legs, and the whole from the knee to the hoof, and a space round the eyes, of a buff-coloured

* Professor Lichenstein, to whose kindness I owe the facilities I enjoyed of drawing and copying zoological subjects both in the Berlin Museum and from the above-quoted collection, regarded the Gouzouapara and the figure as of the female of Azara's Gouzouti, *C. campestris*; but the Paris and Prince Maximilian's specimens prove the mistake. See his paper in the *Berlin Transactions*, 1815. *Die Werke von Piso und Markgrave über die Natur Geschichte Brasiliens erläutert*, &c.



Painted by Smith Esq.
Engraved by M. M.

THE BUNA ROE.

C. nemoriva L. F. Cuv.

white; the exterior side of the thighs and hind-legs fawn colour. We have not seen this species in the Museum of Paris, excepting, perhaps, the head; but there is a fine one in the Museum of Frankfort-on-the-Mayne, sent there from Brazil: the colouring corresponds, excepting that the tone on the back is more yellow. The proportions of the specimen are heavier than in the two former, the legs being shorter and stronger, and the body more compact. A remarkable character is observable in the shape of the fore-arm (radius), which appears to be convex or bent forwards, with the *olecranon* far back, so as to make that part of the limb unusually broad; upon the outer face of it there is only a stripe of brown-gray colour, the rest being nearly white. The bones of the extremities being preserved in the skin, and Professor Grätzmer having assured us that the same form obtains in other specimens, it is probable that it forms a character, and the more so as this formation explains the compacter form of the animal. That learned professor had bestowed the name of *Simpli-cicornis* upon this animal; but as M. F. Cuvier had already appropriated that specific name, we have transferred the professor's to the former species, where it is equally appropriate. According to D'Azara the female produces two fawns with spotted livery, and its manners are solitary in the woods.

THE STYLOCERINE GROUP.

The last group of the genus *Cervus* consists of those who have high pedunculated horns; they all appear to belong to the continent and islands of the Indian Ocean, and to attain but a small stature. The males have long canines in the upper jaw, which protrude beyond the lips, a muzzle, and a deep suborbital sinus; but their most obvious character resides in the elevated pedicles upon which the horns are fixed, the root of which descends in prolonged ridges to near the nose. In the females, who are always

destitute of horns, this character is replaced by two bristly, broad, and dark spots above the eyes resembling eyebrows; or by a coarse dark patch of hair, like a mask or chaffron, which covers the forehead, and descends on the nose, and also retains the brow-like, bristly terminations over the eyes. Mr. Pennant's Rib-faced Deer, or Muntjak, with two antlers upon each horn, appears still unknown; for all the specimens at present in the Cabinets of Europe have only one or none, and the beam terminates in a simple uncinated point without bifurcation: it is probable that this supposed character has arisen from some inaccuracy of expression or of the press. The females have four teats in a quadrangular position. The tongue of these animals is extremely long, so that they can extend it even beyond the eyes, a conformation which they have in common with the Musks, who often lick their eyelids. None of this group appear to shed their horns more than once, the first pricket being replaced by a permanent horn with a small anterior basal antler. The fawns are chestnut-coloured, with numerous white spots, if we may judge of the whole by one brought from Sumatra, and another said to be from Ceylon.

The *Kijang*. (*Cervus Muntjak*.) This species appears to be the *Cervus Vaginalis* of Boudaert, and the *Chevreuril des Indes* of Allaman. The male is smaller than the Roebuck, and of an elegant form. The body is compact, the legs remarkably fine and slender; the muzzle is rather broad, and the canines assume the form of inverted tusks, sharp at their posterior edge, and hanging out of the mouth with their points turned towards the animal and outwards. Two rib-like eminences ascend from above the nose over the eyes, and elevating themselves from the head in the form of slender pedestals to the height of two and a half inches, terminate in a flattened summit. Upon these the horns are placed, about three or four



SUMATRA MUNTJAK.

C. MUNTJAK — *Sumatrensis* ?

C. Hamilton-Smith Esq. del.

Paris Mus.

London Published by G.B. Whittaker Sep. 1. 1846.

inches long, uncinated at top with the points turned inwards, and with a small branch at base pointing forwards: between the ribs, the skin of the face is doubled into a fold, which has the appearance of a third or central rib. The fur is fine and close, of a grayish-brown, paler beneath; the breast, inside and anterior face of the thighs are whitish; the tail is short, dark above and white below. Dr. Horsfield's figure of this animal displays a similar distribution of colours; and his specimen shewing the summit of the pedicles widened in the form of a rose (which is a sign of age), we presume to be that of an old buck.

In the collection of Mr. Bullock there was a female which may be referred to this species from the general resemblance and the colours of the fur. It was about two feet high at the shoulder and three feet six inches long. The head above the orbits was square, and the nose tapering to a small muzzle; the body rather heavy and the legs remarkably delicate; the lachrymary sinus long and very distinct; the head, neck, back, shoulders, thighs, and legs, were dun-gray or a brown and buff intermixed; the hair white at base, close and fine; the lips, throat, breast, belly, and inside of the thighs, white; the ears rather narrow, middle-sized, dusky outside and white within; the tail about three inches and a half long, of the colour of the back; but on the face there was a mark, which we have not noticed in any other female Muntjak: it formed a kind of mask, pointed on the forehead, and tapering down towards the nose, the sides spreading above the orbits, where they ended in a bristly and curling kind of eyebrow. The hair of this part was dark, and harder than the rest; the posterior part of the legs were paler, and the hoofs very small and short. It was an adult, and had been pregnant, for the mammæ, disposed in a quadrangle rather close together, protruded much, and were of a pale rose colour.

These we take for the old specimens of Java, but it appears, also, that there are others of a bright fulvous-brown in the same island, which would cause a suspicion that there is a second species or a variety; but it may be, that these animals change their colours with the monsoons, or what is still more probable, that they are young specimens. In confirmation of this supposition it may be remarked, that the fawns are fulvous-brown, with small white spots, which spots soon disappear: that the young males, distinguishable by their long slender pedicles, have the whitish parts under the throat, breast, and round the lower abdomen more reddish than those which are further advanced in age, when the white becomes more pure as the pedicles shorten and widen at the summit; it spreads also by degrees round the mouth, under the jaw on the throat and breast, and down the internal surface of the thighs. It may therefore be conjectured, that the white part of the hair, which it is invariably at the base, ascends to the surface, and effaces more or less of the fulvous, and constitutes, in reality, a sign of old age: the comparison of above a dozen specimens seem to warrant the opinion.

The individuals sent from Sumatra to Paris are, in truth, all fulvous, and Sir T. S. Raffles describes his Sumatran Kijang with the same colours, the white being visible on the chin, breast, lower abdomen, inside and anterior part of the thigh, and under part of the tail. A female in the Paris Museum, marked from Ceylon, and a male certainly adult, are fulvous; although the pedicle is still long, it is not flattened at the summit, and the horns were in their growing state, the velvet being still upon them. If the opinion of Sir T. S. Raffles respecting their changing horns only once, or at least very rarely, be correct, we may conclude that this also is a young animal. The skuli in Surgeons' College, from which Dr. Blainville drew his characters of *Cervus Moschatus* is of a young male with the

first horns: but a specimen at Paris without horns, of the same fulvous colours as the others, and said to be from Java, shews a particularity not observed in others; namely, a small brush of stiff and long hairs on the outside of the back of the ears, facing the posterior part of the pedicles. In this individual the tusks are double, and the head is smaller and narrower than in the preceding: as the pedicles are above three inches long, it may be conjectured that the individual was killed just after shedding the prickets*.

The manners of these animals are as yet very imperfectly known, they seem, however, to reside in the woods in pairs, or small families: when domesticated they are very gentle and familiar.

The *Philippine Muntjak*. (*Cervus Philippinus*.) If the former specimens may be all referred to one species, the present has characters which leave no doubt of its being different. The specimen in the Paris Museum, brought from the Philippine Islands, is somewhat larger than the above. The horns are wanting, but the pedicles are not above a quarter of the length of the head, and more bulky than in the Rijang; the ribs extend downwards only to between the eyes; the face is plane, the forehead slightly arched. There is a dark streak on the anterior base of the pedicles, and between them the hair is black, forming a spot with the point downwards; on the nose another dark spot turns its point upwards, and leaves a crescent of a dirty buff between them: this colour spreads round the orbits and on the cheeks; the lacrymary sinus is dark;

* In Mr. Marsden's figure there is the same character of youth; but in the Banksian collection are two views of a head by Dr. Forster, where the short obtuse form of the pedicles, and the length of the horns shew age. In these figures the eyes are surrounded with long scattered hairs, and there are similar hairs on the chin: he names it *Cervus Phœnus*.

the ears rather short and obtuse, whitish within, dull buff outside; the colour of the coat is wholly brown sepia-gray, clearer on the throat and darkest on the neck and legs; the tail is three inches long, black above, and white beneath.

The horns being absent, this most essential point remains undetermined; but the Baron conjectures that a small skull, with very short pedicles, and, nevertheless, supporting horns nearly as long as those of the Kijang, with a distinct burr, and a small anterior antler turning inwards, might belong to this species.

Blainville's Muntjak. (*Cervus Subcornutus.*) This species was established by Dr. de Blainville, from a skull in Surgeons' College, London. The horns resemble those of the Sumatra specimens, but smaller, with a regular burr, a small process in front, and the point of the beam turned back, and not towards its opposite horn; the pedicles are short, strong, very prominent, but not much prolonged on the face, and no canines are seen in the maxillæ. We omitted to draw this specimen, but believe it much smaller than the Kijang, and feel inclined to consider it as belonging to the Philippine.

The Ubi Muntjak. ? (*Cervus Aureus*, Nob.) In Mr. Bullock's collection we found another stuffed specimen of a female, which at first sight might be taken for an antelope, but the supercillious spots of dark strong hair, and square forehead, leave no doubt of its affinity to Muntjak. It was three feet four inches in length, with slender elegant formed legs, in height about two feet to the shoulder; the head was seven inches long, the nose tapering, and the muzzle not black; above each eye a streak of strong reclining glossy brown hair; the lachrymary opening large; the eyes rather nearer the muzzle than in the former; the tail four inches long, formed a black tuft; the ears were broad, somewhat naked within, and four inches long; the shoulders, back,



FEMALE WILD MUSTANG?

CERVUS AUREUS—Hamilton Smith.

Hamilton Smith Esq. del.
Vullock's Museum.

T. Landseer sc.

London Published by G.P. Whittaker Bow 118/6.



NEPAUL MUNTJAK.

C. MOSCHATUS—Hamilton Smith.

and rump, were of a bright fulvous-yellow; the neck and face not so brilliant; the nose dun; the throat, belly, inside of the limbs, and fetlocks, pure white; the external side of the legs buff; the hoofs black, small, and pointed; forming altogether the most beautiful creature of the whole species. Its native country was unknown, but we recollect that a deer, termed at Exeter 'Change the Golden Deer, with bright yellow horns, was once brought there from some part of India; it was soon removed, being presented to some private person. We would refer this female, though with great hesitation, to Sir T. S. Raffles's *Rusa Ubi*, noticed in his account of the *Rusa*, *Lin. Transactions*, vol. xiii., which, according to the natives of Malacca, is of a reddish colour, with unbranched horns, covered with hair to within a short distance of the point. It is also called *Rusa Saput*. The colours described by ignorant natives in a different language, are not a sufficient reason to reject the supposition: certain it is that the Malacca animal here mentioned must belong to the group of Muntjaks.

The *Nepaul Muntjak*. (*Cervus Moschatus*.) In the *Oriental Collections*, for January, &c., 1798, vol. ii., Sir William Ousley figures an animal under the name of Musk-deer of Nepaul, from a drawing executed by a native artist, with the following dimensions, communicated by Colonel Ironside:—Length from between the ears to tail two feet four inches; height two feet; length of head seven inches; of the tail six inches and three quarters; of the tusks two inches and one-eighth; the hair bristly and thick, two inches long. By the illuminated plate, the animal must be entirely dull fawn colour, with the superior part of the tail alone dark; the horns placed upon high pedicles are dark, simple, without branches, and pointing to the rear; the limbs are very slender; the spurious hoofs small; the neck rather short. The habitat and character of the

hair, render it probable that it is a distinct species; and although no reason is assigned for the name of Musk-deer, that being the designation of the natives, render it probable that it is impregnated with a musky smell. The skull designated as *Cervus Moschatus*, by M. de Blainville, may belong to this species.

The GIRAFFA. (Camelopardalis Giraffa.)

We are now to consider an animal of so extraordinary a form and lofty stature, that even the stuffed spoils, the almost shapeless representative of the living creature, produce upon the eye of the beholder a mixed effect of awe and astonishment. Our imagination is involuntarily led back to the early epochs of the world, when colossal beings peopled the earth, and were the undisputed possessors of every region: we fancy ourselves in the presence of one of the survivors of the great diluvian catastrophe, when the Mastodon, the Megatherium, and, perhaps, its own congeners, were swept away, to leave this one species, among a few others, to attest what were the forms of a primitive animated nature. The Giraffa stands isolated among the ruminating animals in family, genus, and even in species; its characters offer a mixture of several genera, among which the quinary system may select whether to class it with Illiger among Cameline, or with other naturalists among Cervine or Antilopine animals. By the length of the neck, the callosities on the sternum and knees, and by the want of spurious hoofs, it assimilates with camels; and so obvious is this approximation by the addition of stature, that it did not escape the notice of the ancients: but the pedunculated form of the frontal processes, in the shape of horns, recall that character in the Styloceri or Muntjak Deer; while the stiff hairs which crown their summits seem to want only the gluten to cement them into true horns, and embody it, in systematic arrangement, with the *Cavicornia*.

This affinity is indeed maintained by other characters, such as the elevation of the anterior extremities, and of the spinal processes of the shoulders, and the corresponding depression of the posterior quarters, which seems to connect it, through *Bubalis*, with the *Acronotine* group of our proposed genus *Damalis*. The similitude of conformation is further perceived in the general shape of the head, the ears, the eyes, the body, and the tail; yet the Giraffa is possessed of characters exclusively its own, for beside the bony processes covered with skin, and surmounted with strong bristly hairs, there is a spherical elevation on the forehead, elongated towards the nose; the nose and lips resemble that part in a horse, and the colour of the coat is dirty-white, marked with large, approximating, angular, and somewhat regular blotches of a dark-brown or rufous colour; from the back of the head to the end of the shoulders a short erect mane passes down the neck, marked by alternate spaces of black and white. From a comparison of these characters, the Giraffa appears most naturally placed immediately after the Muntjaks, and before the leading *Capricornia*, or that family of ruminants which is distinguished from all the preceding by the possession of true horns.

The name of Giraffa is derived from the Arabic *Zuraphahta*, which is itself corrupted from *Amharir Zirataka*; and the Romans who had seen this animal several times exhibited from the period of Cæsar, described it under the name of *Camelopardalis*, on account of its similarity to the Camel in form, and to the Panther or *Pardalis* in spots. Pliny, Ælian, and Strabo, have noticed the animal, but the first satisfactory description is found in the *Æthiopica* of Heliodorus, Bishop of Tricea. "The ambassadors," he says, "of the *Axcomitæ* (Abyssinia,) brought presents to Hydaspes, and among other things, there was an animal of a strange and wonderful species, about the size of a camel, which had its skin marked with florid spots; the hinder

parts from the loins were low, like those of a lion, but the shoulders, fore-feet, and breast were elevated above proportion to the other parts ; the neck was small and lengthened out from its large body, like that of a swan ; the head in form resembled a camel's, but was in size about twice that of a Lybian ostrich, and it rolled the eyes, which had a film over them, very frightfully. It differed in gait from every other land or water animal, and waddled in a remarkable manner ; each leg did not move alternately, but those on the right side moved together, independently of the other, and those on the left in the same manner, so that each side was alternately elevated. This animal was so tractable as to be led by a small string fastened to the head, and the keeper could conduct it wherever he pleased, as if with the strongest chain. When it appeared it struck the whole multitude with terror, and it took its name from the principal parts of its body, being called by the people, extempore, *Camelopardalis*."

The Giraffa in an adult state is reported to be sometimes nearly twenty feet high from the summit of the head to the sole of the foot. Among a dozen specimens which we have seen, Mr. Burchell's male, in the British Museum, is the tallest, and measures seventeen feet six inches ; the rest did not exceed sixteen feet. The head is about two feet six inches long ; the height from the shoulder to the ground ten feet nine inches, and from the breast to the ground near six feet ; the hornlike processes eight inches long ; height of the croup above nine feet ; and the tail, including the tuft, near five feet. The females are smaller than the males, and have four inguinal mammæ ; they are said to be gravid a twelvemonth, and to produce only one calf at a birth. This at first is spotted like the mother, with rufous marks, which darken, if it be a male, to deep brown. In the teeth of this animal the external incisors have a bilobate form. It is gentle in disposition, and might be easily rendered domestic, and extremely useful to traverse

the deserts of South Africa, and supply the place of the Asbaarys, or the fast-going Camels of the north.

The Giraffas live in small families of seven, eight, or even fifteen, on the plains of the interior, and principally on the great Southern Sahara, where there is herbage or succulent vegetation; but this, from their great height and the comparative dimensions of the neck and limbs, must be inconvenient to gather, and it is known that the Canaap Kameeldoorn, or *Mimosa Camelopardalis* in particular, is their favourite food. They amble in gait, with the head stretched forward, and are not remarkably fleet, notwithstanding their length of limb. From the great elevation of the head, no use can be made of their hornlike processes for defence, but they kick and strike with prodigious force. It is asserted that the Lion seldom preys upon the Giraffa, because the hardness of the hide is so great that he cannot tear it, even when he has sprung upon their backs; and that he is sometimes carried a great way, and at length thrown off without effecting his purpose.

Modern Naturalists have known the Giraffa only since Mr. Patterson, Colonel Gordon, and M. Le Vaillon found it in South Africa; but as the Romans were acquainted with the animal, it must have existed in the north of the equinoctial line. It would appear, moreover, that a variety or second species is found in Central Africa, for Mr. M. Park, in describing his escape from captivity among the Moors, noticed an animal of a gray colour, which he refers to the *Camelopardalis*; and although it was seen by him passing, the form cannot well be mistaken for any other creature. We would consider this animal as the Wild Camel of the mountains, the existence of which we have had attested by several Negroes who had been brought from the interior; and in the Praenestine Mosaics, where two spotted *Camelopardales* are seen together, a larger animal is likewise represented with short horns, but without spots, and

the name TABOTC written over. In a drawing of the same Mosaic, the word appears to be partly effaced, but to have been PAΦOTC. It is remarkable that while the spotted figures are without a name, the animal in question, occupying that part of the picture which designates the Cataracts of the Nile, should be called by the Æthiopian appellation, which, according to Pliny, was Nabis, resembling the Hottentot Naip; or by the second reading be like the Arabic, or one of its dialects*.

THE CAVICORNIAN FAMILY.

The ruminants which constitute the remainder of the order, seem to be all constructed after one model, their osteological characters differing only in proportion, or in the greater or less development of parts. The males of the whole, and the females of most of the species, are provided with real horns; that is, with osseous prolongations from the frontals, covered with a horny substance, not deciduous nor growing out from the extremity, but receiving their increase at the base. Although the number of species is very considerable, it is difficult to assign sufficient characters to divide them by distinct and permanent indications. They may be viewed as forming one great family divisible into two tribes, the Caprine and Bovine; but it cannot be concealed, that this division, certainly convenient, is, nevertheless, arbitrary in its limits, for the

* The Negroes who asserted that there is a wild camel in Central Africa, agreed in the colour being ashy, and in the animal having horns and tusks: they represented it to be very large and fierce, but none had been near one. The Prænestine Mosaic is said to be of the time of Marius; but what appears better proved is that Egyptian Greeks were the artists employed to make this kind of work even in Italy and Spain, as is evident from the birds, fish, &c., figured. In the fragments of a Mosaic at Avenches (Aventicum), in Switzerland, the *Mormyros Oxyrynchus* of the Nile, cannot be mistaken.

passage from one to the other leaves a doubt where that limit should be fixed. Nature, however, shews the same difficulty wherever the species allied have been studied in sufficient numbers. Neither artificial nor natural characters enable us to mark the links of the chain, or rather the knots in the web, by which every kind of animated being is connected with others in a greater or less degree of affinity. We shall find, in the following pages, the ruminants subjected to the same laws which obtain in other orders; namely, to undergo a sort of cycle of all the variations of subordinate characters consistent with their typical plan; the last of a series resuming some of the distinctions of the first, and both possessing others which connect them with the preceding or succeeding genera.

THE CAPRINE TRIBE.

Both the artificial and natural systems agree in placing at the head of the family, those animals which retain the forms of Deer, with the true attributes of their own section, and, consequently, the genus *Antelope* precedes the others. But before we enter upon our view of the subject, it may be proper to make some preliminary reflections. By the common consent of naturalists, the extensive tribe of Caprine animals is composed of species extremely different in shape and size, but linked together by a constant succession and interchange of subordinate characters. A fanciful theory might view the numerous species connected by this sort of consanguinity, as resulting from several types originally endowed with the faculty of procreating, by their intermixture, subordinate prolific races, which in their turn became the types of species and even of groups. Buffon clothes a theory of this kind with the gaudy colours of his brilliant imagination: two distinct species appear to him as descended from a third; one bearing the impress of the male, the other of the female predominance of characters

observable in the original parent species, and constituting two new lines of a spurious genealogy. But although it is asserted and believed that the Goat and Sheep produce an intermediate prolific race, comparative anatomy and continued observation have gradually reduced these speculations to very restricted limits. Where the number of species is very considerable, and the characters by which genera and racemi can be divided, are so insignificant and evanescent as the flexures of the horns, inguinal pores, &c., varying and interchanging in a manner that might almost appear capricious, the difficulties of a systematic arrangement in a natural order are great, and appear surmountable only by degrees, as our knowledge extends over additional species, and we clear away the confusion produced chiefly by an injudicious application of all the known names and partial indications of travellers, to the very few species first described by Buffon, Pémant, and Pallas.

Linnaeus, who was acquainted with few animals now usually classed with *Antelope*, seems to have been led by the observation of Pliny, that "goats assume many forms, &c., including *Oryges*, *Damæ*, *Pygargæ*, *Stresicerotes*, and many others;" and, therefore, instituted but one genus, *Capra*, for the whole, excepting the Sheep, which he kept separate, without a distinctive character more prominent than many of those which he threw together in the Goats. Buffon, notwithstanding his generalizing principles which converted species into mere varieties, opposed artificial, and even natural classification to the extent of regarding, on some occasions, the absolute integrity alone of specific isolation; and then seeing no greater degree of affinity between the small and the larger species, than he found between the Ox and the Sheep. But with the increasing number of species, Pallas first perceived the propriety of separating certain animals from the Goats, and instituting a new genus, founded principally upon the round, annu-

lated, and often spiral character of the horns. To designate the new genus, he applied generically the English word antelope, which, since the time of Ray, was appropriated to the common or *Cervicapra* species, although long known in the list of fabulous beings, which heralds are supposed to have invented for the purposes of their art, but which, in this instance, was intended to designate a true antelope of the *Orygine* group. The earliest indication of this kind, in English heraldry, is, we believe, among the cognizances of the Plantagenet branches, issuing from King Edward III., about the close of the fourteenth century. The Antelope was a symbol of an honour held by the house of Lancaster. John of Lancaster, the great Duke of Bedford, bore his arms supported by this animal*, and from the time of King Henry IV., the office of *Antelope Pursuivant*, had been instituted and continued to the end of the Lancastrian branch. Whether heralds had an obscure knowledge of the animal through their intercourse with the Crusaders, cannot now be ascertained; but the name itself, appearing nowhere in classical Greek or Roman writers, seems derived, according to the learned researches of Baron Cuvier, from *Ανθολος*, used by Eustathius, Bishop of Antioch, who wrote during the reign of Constantine†.

* The arms of this Prince, painted, among other embellishments, upon a prayer-book, once his property, and bearing evidence of the Bruges style of that period, represents the Antelope black, with straight spiral annulated horns, evidently copied from those of an oryx, though placed almost at right angles upon the head; the animal has gilded tusks, but in other respects is not ill drawn. The Antelope is at this time the badge of the sixth regiment of infantry.

† The Baron, indeed, writes *Antholopos*, probably from an error in the press: it occurs in the *Hermaeron*, and is sufficiently curious. The *Antholopos* is represented as very swift, and hunted with difficulty; it has long horns in the shape of saws, with which it saws trees of considerable elevation and thickness. When thirsty, it approaches the Euphrates, and gambols along its borders in the brambles, where it is sometimes entangled, and there caught and slain.

What animal he understood by it is not very evident ; the compound name might be a mere paraphrase of Gazal, and meant to signify fine or blooming eyes. Other names are, however, derived from it in the Greek and Latin of the middle ages. Antalopos, Analopos, and Aptalos of authors, the Calopus of Albert the Great, and the very Panthalops which Bochart would make a Coptic word to designate the Unicorn, are all corruptions of one, by which the Greeks of Western Asia seem at one time to have understood an oryx.

From the institution of the genus, all Bisulcæ which did not clearly belong to the other genera already established, were without further consideration crowded into *Antilope*, till the last formed exceeded in number of species all the others taken together. In the confusion, naturalists were struck with the very great disparities in the extreme species ; various subordinate associations were attempted, but no additional genera, excepting, we believe, by M. Brisson. At length Professor Lichtenstein formed the twenty-nine species then known into four families or groups, the Bubabides, Connobætes, Antilopæ, and Gazellæ. M. de Blainville soon after instituted eight subgenera, which he distinguished by the names of *Antilope*, *Gazella*, *Cervicapra*, *Alcelaphus*, *Tragelaphus*, *Boselaphus*, *Oryx*, and *Rupicapra*, in which he noticed thirty-nine species. To these M. Desmarests added three more, the *Egoceres*, *Oreas*, and Mr. Ord's *Antilocapra*.

Although these arrangements certainly tended to the perfection of our knowledge on the subject in question, yet the species being many of them very imperfectly known, found their location in the subdivisions to which they do not belong, or groups were formed of animals sufficiently distinct to constitute separate genera. The flexures of the horns gave alone a simple, but at the same time a purely artificial, classification, in which the most remote species

were placed in juxtaposition. It may be presumed that the defective state of our information induced the Baron to confine his view to such species as he had the means of comparing osteologically, and observing the want of importance in almost all the characters which can be assigned, to rest contented with the artificial arrangement just noticed, nearly such as Pennant and Shaw had left it. In adopting the artificial arrangement, that great zoologist, so far from objecting to a natural classification, points out himself the necessity of alterations, and among others that of removing the Gnou.

In this state we found the leading genera of the *Cavi-cornia*, and in particular Antilope, when our own collection of notes and drawings relative to this genus had been gradually accumulating for twenty years, the fruit of personal researches on the west-coast of Africa, the wilds of both Americas, and the examination of forty-two public museums, and many private collections in both continents, until we were enabled to compare our sketches from living and stuffed specimens, amounting to one hundred and thirty-five representations of animals, and above one hundred of fragments, skulls, horns, skeletons, feet, &c. In this enumeration all those are excluded who, upon comparison, were not different in species, sex, age, or variety of colour, or other circumstances. With this mass of materials, superior, we believe, to what can well be in the possession of other Zoologists, we find it, nevertheless, far too scanty in documents to come at a disposition sufficiently satisfactory for the expectations of science: but enough is amassed to prove that the indications of travellers have commonly more precision and truth than has been admitted; and that the imputations of negligence and ignorance, which are so convenient to writers of nomenclatures and systems, generally take their origin from a disposition to force separate subjects, species, and names, into one

known designation. Notwithstanding that an attempt to establish a natural succession of groups, encumbered with its endless recurrence of anomalies, is further impeded by the interposition of the genera *Capra* and *Ovis*, we shall endeavour to show the progress made to be principally derived from the accumulation of new species, whose characters have led to an additional number of groups for some, and the proposition of two new genera for others; thus forming a connected series of all the *Cavicornia*, the *Caprine* tribe passing into the *Bovine* at an arbitrary point of separation, which it seems resides among those species which are strictly independent of either.

In every attempt to find characters sufficiently constant to serve for distinctive signs of the groups or *racemi*, even when these are considerably augmented in number, we found that the flexures of the horns were inapplicable, because they occur seldom more than in one animal of a group, though in all other characters its component species are perfectly homogeneous. As, therefore, the horns assume in osculant species a great variety of shapes, recourse was had to the combined characters of stature and the superior elevation of the spinous processes, arising from the interscapular vertebræ, the comparative depression of the croup, the position of the osseous nuclei on the frontals, provided with a cell at their base, and other inferior distinctions, all of which we wish naturalists to verify. These afforded data sufficient to separate most of the larger anomalous species from the genus *Antilope*, and to place them under the proposed name of *Damalis*, near the *Bovine* tribe. To the *Bovina* we refer the *Gnoo* of authors, also forming a new genus distinguished generically as *Catoblepas*, and forming the first of this, as *Damalis* constitutes the last of *Caprina*. Having thus far disposed of the evidently-anomalous species, it was desirable to arrange the succession of the subgenera or groups retained in *Antilope*, so as to place those

who still bore an analogy to *Cervus* nearest that family, and then to class the true Antelopes and Gazelles into approximating gradations to *Capra* and *Ovis*. At the head, the groups *Dicranocerus*, *Aigocerus*, and *Oryx*, might, perhaps, be more properly converted into genera; but that the two latter seem to form types to which the cycle of the tribe returns through *Damalis*: and, besides, the *Oryges* contain the species from which the genus *Antilope*, as already noticed, obtains its name. Notwithstanding their size, the characters of *Oryges* are truly antilopine, and the *Aigoceri* have so much affinity to them that they cannot be separated with propriety by the interposition of others. As such these two *racemi* should take the lead, if the small American group *Dicranocerus* did not appear more naturally placed before them, because they have a greater external similarity with Deer. After these three, the *Gazelle* and *Antilopes* follow, succeeded by the *Reduncæ*, *Cervicapræ*, and other *Racemi* or groups, several of which we have thought it advantageous to place into additional subgeneric clusters, designated by proposed names which either explain some common property in the species or are derived from an indigenous name. Should some of these groups be hereafter considered as real genera, the proposed denominations and locality in a natural order may here, we hope, be found approaching to their fixed position in nature. The latter groups in the series assimilate gradually with *Capra*: among these, *Nemorhædus* has nearly all the characters of true Goats, but is still possessed of antilopine horns, and *Anoa* presents the anomaly of caprine characters with horns which partake of the Buffalo and *Ovis*; while *Aplocerus* shews another anomaly of characters; in which *Nemorhædus* is compounded with both *Ovis* and *Capra*, and as such it is the last, and forms the connecting link with these two genera. After these we place our proposed genus *Damalis*, divided into groups according as their more

obvious characters seem to lead them nearer to Bovina, the last being Portax or Antilope Picta of authors. It is at this point that we think the separation may be deemed arbitrary, because all the Damales might be viewed by some as more properly included in the Bovine tribe; but reflecting that the Aconotine group in particular, recalls the high shoulders of the Aigoceri, it seems that we find the cycloid revolution of the characters which pass through the tribe, while the next Catoblepas shews a predominancy towards those which constitute true Bovina, in the head which approaches Bos Caffer through Ovibos and the feet to B. Bison, where we terminate the order.

Of this arrangement we dare only say, that it seems to be the least objectionable in the present state of our knowledge on the subject; awaiting the judgment of Zoologists, whose opinions we hope to apply at no distant period in an intended monograph, in which we shall be anxious to produce figures of both the males and females of many species never before published, and the anatomical fragments of others, whose complete forms are still wanting in the published works of authors: but although we have said thus much to establish our motives for the present distribution, we cannot but view the propriety of the innovations with doubt and hesitation.

Notwithstanding our assertion that no fossile remains of the Caprine tribe, Antilope, Capra, Ovis, and Damalis, have yet been satisfactorily determined, it appears that Baron Cuvier regards several fragments, found in the oolite brecciae of Italy and the Adriatic, as probably derived from them.

THE GENUS ANTILOPE.

This genus forms the head of the Caprine tribe, because its subordinate groups display almost invariably cervine proportions in the elegance of their conformation, and one

group in particular carries the resemblance even to a similarity in the shape of the horns. In common with the rest of the *Caprina*, their horns are persistent; consisting of a solid bony core, with a true horn vaginating upon it. These are present or absent in the females and in the males, sometimes to the number of four. The core or osseous nucleus is solid, destitute of sinus or pores within the base; it stands generally almost above and between the arches of the orbits. The horn itself turns into various curves or directions, often without consimilarity in the kindred species of the groups. The ears are usually long, moveable, and furnished on their internal surface with three striæ of whitish hairs upon the naked darker ground of the skin. The eyes, likewise in the greater number, are large, prominent, dark and soft, and beneath them, in the direction of the nose, a sack is found in most species, more or less developed, opening externally by a slit, as in certain deer, and in some appearing to communicate with the nostrils and the olfactory apparatus; while in others again, a puncture only is seen, and a second sack descending near to the corners of the mouth, likewise communicates externally by a slit or a puncture; the former of these seems to afford increased facilities in breathing, and greater powers of scent; but the use of the latter is as yet unascertained in the animal economy. The nostrils are usually shaped as in sheep, or without a naked and moist muzzle: some, however, have this form half developed, or a half muzzle, and others again have one as complete as in the Stag, but never to the extent which is seen in the Ox or Buffalo. They are provided with a gall-bladder. The mammae of the females are always inguinal; in number either two or four, and these are often observable in a rudimental state on the abdomen of the males. Beside these, in the hollow part of the groin, small naked folds of the skin or inguinal pores are found, one on each side of many of the middle-sized

and small species. Within them an unctuous and odorous secretion takes place, similar to that which is found in the suborbital sinus, but the use or utility is not as yet ascertained, though some inference might be drawn from a habit common to the species provided with them, of rubbing and pressing both these parts against hard substances, and then seemingly deriving great pleasure in smelling at the substance extruded. The tails of these animals are round, either short, or descending to near the hough; the legs of nearly the whole are slender, firm, and elegant, often furnished with brushes or tufts of hair on or below the knees, and the greater number have the anterior quarters somewhat lower than the croup. In general their attitude is more gathered; that is, they stand with the feet more under them than Deer, and hence, their bounds are greater, and their speed in general surpasses that of every other mammiferous animal. The hide is either white or black, but these colours seem to be constantly connected with locality: the black being, perhaps, invariably independent of the colour of the hair, an indication that the animal is a resident of the open burning plains and deserts of the tropics; and the white, one who resides in more temperate regions, or lives under the shadow of the forest.

The groups with spiral and lyrated horns are mostly gregarious, frequenting the open plains, and often preferring the most barren tracts; the larger species, however, more usually live in families or small troops, on the desert or in mountainous woods, and the smallest are not unfrequently solitary or monogamous, residing in the thickets, the forest, or the borders of rivers; while there are others whose habitat is confined to mountainous regions, inaccessible craggs, and even to the elevated zones on the confines of perpetual snow. These walk with perfect composure along the giddy brinks of the most awful precipices, climb and descend with wonderful care and precision, and leap

down or up to the smallest surface that will contain their collected feet with perfect firmness ; but the speed of those who frequent the plains, and more particularly of the swiftest species, consists in the alternate action of three or four strokes of a gallop, terminated by a long bound, repeated in constant succession and producing a beautiful effect : of others it is an uniform stretch termed running. Though vigilant and timid by nature, the gregarious species have the same curiosity which Deer and Sheep evince at the sight of strange objects ; flying with prodigious speed, then stopping and turning to gaze. Their voice is mostly weak, and seldom heard : it consists in some in a feeble bleating, in others it is a groaning or whistling sound, and there is one which barks so as to deceive the unwary traveller into a belief that he is near the abode of man, when in fact it is the proof of his being benighted in the deepest recesses of the wood.

In a wild state it seems that each species feeds on a few favourite plants ; they pick rather than browse : some, like several species of Deer, nibble the leaves of trees, Acacias, Mimosas, and shrubs. The gregarious keeping on the open plains, select grasses and their roots, heaths, wild tritica, and are not averse to bitter succulents and intoxicating plants, being even attracted by the smoke of tobacco. There is a disposition in several species to dung in one place, which arises probably from the extreme delicacy of their sense of smelling. In general their venison is lean, and savours of a musky or a Caprine smell ; but the flesh of others is praised, and all afford the usual meal to the larger nocturnal Carnivora, and even to the Eagle. The females, particularly of the gregarious species, are gentle and confident when reduced to domesticity, but the males, at least in the rutting season, are vicious and subject to sudden capricious fits. The beauty of their soft and large dark eyes, has long been the theme of Arabian and

Persian poetical enthusiasm. The very name Gazelle, by which several of the genus are designated, is derived from the Arabic Gazal غزال signifying this animal, or a young fawn, is also an image of peculiarly tender and delicate women; it is likewise applied to a species of stanza of highly polished and tender versification: the root, however, seems taken from the Hindu Sasi or Sasin, the name of the Common Antelope. It appears that in the beautiful regions of the East, beyond the river Indus, these animals have attracted the notice of mankind in an extraordinary degree, even in the primitive ages of that land of early civilization; for we find them in the oldest mythologies, and among the symbols of its astronomy. The Sasin figures in the Rasi Chakra or Hindu Zodiack, instead of Capricorn; the goddess Chandra or the Moon rides upon an Antelope, and Mahadeva Pancha Mukti holds one of these animals by the legs. In the *Institutes of Menu*, certainly more ancient than the Macedonian invasion, we find that under certain circumstances, the Bramins were not only allowed but directed to be fed on the flesh of the Ena or Spotted Antelope, and the Ruru which appears to be the *Leucoryx* *. From these causes the whole genus is held sacred to Chandra or the Moon: but it may be surmised, that this consecration was originally confined to some species, perhaps still undescribed, whose horns exhibited a sort of resemblance to a crescent.

We begin by the group which, in the form of the horns, the short tail, and disk on the buttocks, approaches nearest to the Deer.

* See the *Institutes of Menu*, chap. iii. v. 269. They were to be fed six months with the flesh of Kids, seven with Spotted Deer, eight with that of the Spotted Antelope (*A Cervicapra*), called Ena, and nine with that of the Ruru: the Risia or Antelope *Picta* of authors, is not considered as belonging to this series in the Sanscrit writers.

THE DICRANOCERINE GROUP*.

Mr. Ord published an account of the first, and, perhaps, only species of this group, in the *Journal de Physique*, 1818; after M. de Blainville had noticed, in a very imperfect manner, a pair of horns which are in the Royal College of Surgeons, in London, under the erroneous name of *Cervus Hamatus*. Next appeared an article in vol. xiii. of the *Linnean Transactions*, where five species of America are introduced, and described as *allied* to the genus Antelope. Mr. Ord very properly regarded the animal he described as an intermediate species, and upon this opinion formed his genus *Antilocapra*, a denomination which we would adopt but for the consideration stated below†. In

* Δικρανον, furca, κερας, cornu.

† Dr. Harlan, in the *Fauna Americana*, professes himself ignorant why the author of the paper in vol. xiii. of the *Linnean Transactions* on animals of America allied to the genus Antelope, did not adopt Mr. Ord's specific name of *Americana* for the animal in question, his description having the right of priority. In justice to both these gentlemen it may be proper to observe, that Mr. Ord may himself recollect the author's statement in 1817, of his intention to publish his drawing and notes of this animal before he, Mr. Ord, had laid his before the public. Accordingly the materials were prepared for the purpose, but delayed by a protracted course of travelling, and still more by remaining about two years at the Linnean Society. Hence Mr. Ord's and M. de Blainville's were unknown, if not posterior to his own original paper: but if the author had known of their existence, he is still free to confess that he would not have adopted the proposed nomenclature, because, philologically considered, the compound word *Antilocapra* offers a vicious structure, being composed of two different languages, and the first part not even classical Greek. Now in technical terminology we have the authority of Fabricius to reject them. *Nomina Hybrida nullo modo toleranda*. Next, if the names of genera and species are intended to convey some notion of the form and characters of the subject they intend to designate, the compound *Antilocapra*, would express an intermediate between Antelope and

common with Messrs. Ord, Harlan, and Rafinesque, we consider this species as described long since by Hernandez, under the name of Mazame; and we presume the dissent of M. Desmarests has arisen from his not having had the same opportunity to compare the specimen of *Furcifer* with the plate of Hernandez, of the edition which we consulted at Philadelphia; and, perhaps, from his not having a faithful translation of the paper in the *Linnean Transactions*. This opinion is countenanced by his assigning, in the *Mammalogie*, to *A. Palmata*, "Pelage d'un fauve clair sur le dos, blanc au ventre et sur les flanes," characters which are not in the description of that animal, but

Goat, or an idea of that group which will be designated here under the term of *Nemorhædus*, whereas the resemblance is between the Antelope and Deer, by the most characteristic indication in the creation, namely, the branched horns. As for the trivial or specific name *Americana*, no doubt names of geographical designation are occasionally proper for specific appellations, especially if they refer to more confined subdivisions of the earth, and the subject is destitute of prominent characters, or is both large and isolated. Thus *Elephas Asiaticus*, *Rhinoceros Sondaicus*, are as proper as *Ursus Americanus* is objectionable, and only to be retained because long established: for, in the distribution of animated nature it is a law, with but few exceptions, even in the middle-sized Mammalia, that in whatever portion of the earth of considerable magnitude a species be found of any genus, two or more allied to it may be looked for; and, therefore, upon the discovery of a first as yet isolated species, the name, if possible, should be expressive of some obvious character, or the local name, if not too barbarous, should be latinized, in preference to a geographical denomination, and most particularly so if that denomination would extend over a fourth part of the globe. Where none of these occur, a provisional name, even of a person, is preferable. For these reasons the name of *Furcifer* is retained in preference to *Americana*; but not even for them alone, but also because at that very time the author had already, as in the case just specified, a second of the same genus or group, which he had reason to consider of the same country, to indicate.

appear to be added from Hernandez, unless that acute zoologist, in opposition to his own doubts, admits the soundness of the author's supposition*. Now the text of Hernandez appears clearly and distinctly to apply to one of this group, and most likely to *A. Palmata*. "Mazames," he says, "*Caprarum mediocrium, paulove majori, constant magnitudine; pilo teguntur cano et qui facile avellatur fulvoque; sed lateribus et ventre candentibus, . . . cornua gestant Juxta exortum lata ac in paucos parvosque teretes ac præacutos ramos divisa; et sub eis oculos.*" This description cannot apply to any known Deer of America, not even to *Cervus Coronatus*, still less when we refer to the figure Recchus, who justly viewed this species, and possibly another to be noticed in the sequel, as Antelopes, or in the language of his time as Capræ; says, "*Hos (Telethæal Mazame et Temmamazame) ego potius computaverim in capreos quam inter cervos†.*" The original mistake was made by Count de Buffon, who, in a sweeping clause, for which he most certainly had not sufficient grounds, refused to America indigenous Goats, Sheep, and Antelopes, prior to the discovery of that hemisphere by Europeans: it must, however, be confessed, that so extraordinary a conformation in the horns as the *Dicranoceri* offer, could scarcely be suspected from the rude plates of earlier naturalists, unless they had been explained with that care and minuteness which the moderns generally observe.

The Subgeneric or Racemous name *Dicranocerus*, which we propose for this group, is sufficiently explicit to require

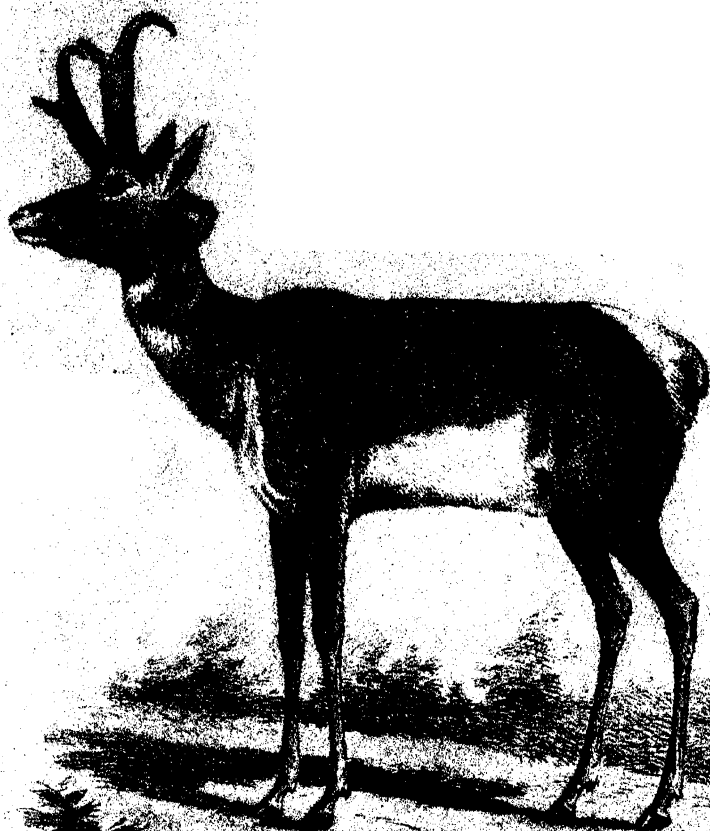
* Mr. D. is likewise not correct when he says, "*Cet animal que,*" Mr. H. Smith, "*Rapporte au Mazame d'Hernandez.*" . . . Now the text says that the Mazame is one of the group, and, probably, *A. Palmata*.

† Nard. *Ant. Recchus apud Hernandezium*, lib. ix. cap. xiv. p. 324 et 325, *figuras ad ipsius paginas.* See also *Hernandez rerum medicarum Novæ Hispaniæ Thesaurus*, cap. 15, p. 324.

no further observation : the animals included are, as far as they are known, exclusively American, and confined to its northern latitudes. By the singular structure of their horns, which have an anterior branch, and a prolonged posterior point turned down into a hook, there is a similitude though no affinity with the Deer : which is further evinced by pearly rugosities, shewing like incipient additional branches, by a white space on the rump, and a short tail. They are exceedingly swift, living in small families upon the hills below the high mountains, and above the low lands along the Upper Missouri, round Hudson's Bay, and, probably, to the extreme verge of the north-western coast of Nootka, and Behring Straits ; they might be looked for on the north-eastern shores of Asia, but although the Argali has spread to both Continents, it does not appear that this, the *A. Lanigera* or the Musk Ox, have yet been observed alive in that quarter of the world.

In the Journal of M. Le Ray, an account appears of the mode adopted by the Sioux Indians in hunting these animals. He says, "that being with the hunters on the river Jaune, in pursuit of the Cabree, as they are termed by the Canadians, the party selected for the sport a hill, the ascent of which was gradual, but the opposite precipitous : at the bottom of the slope they formed a chain of hunters, and crawled gradually and simultaneously towards the summit, slowly inducing the game to approach the precipice. When arrived at a convenient height, they all suddenly rose and gave a loud yell, which terrified the timid creatures so completely, that most of them sprang over the brink, and were dashed to death in their fall. Upwards of sixty Cabree and big-horned sheep being thus slain in a single beat."

The *Prong-horned Antelope*. (*A. Purcifer*). In the general aspect of this animal there is a resemblance both with the Chamois and the Roebuck, though it is larger



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PRONG-HORNED ANTELOPE.

A. FURCIFER.

than either. The form is more elegant than that of the first, and the structure more robust than in the second. The horns are about a foot in length, measured along the curve, five inches in circumference at base, compressed, nearly flat on the inside and roundish on the outside, having small horny pearls scattered principally on the internal surface, among transverse wrinkles and striæ: they stand in a tufted base nearly between the orbits, and two inches asunder, directed vertically, but hanging slightly over the eyes. They carry the same thickness upwards about seven inches, where the anterior part terminates in a compressed and striated snag, pointed forwards and upwards, forming a fork with the posterior part, which becomes suddenly round, taper, and smooth, and turns backwards and inwards, ending in an obtusely pointed hook; their colour is a brownish-black, the horny substance thin at the base and slightly translucent, and the hollow within sufficient to admit the two fore-fingers; the eyes are large, dark, and placed high in the head; the nose is small, slightly convex, and ovine; the forehead broad and flat, the edges of the orbits solid and prominent: no suborbital sinus is visible. The ears are six inches long, narrow, pointed, fawn-coloured outside, and lined with long white hair; at the back of the head the hair rises, and forms a kind of tuft of a reddish colour; the forehead, nose, temples, neck, back, and hams, are of a foxy-dun colour, with the sides paler; the lips, chin, two spots on the throat, one on the top of the head, one below the ear, the breast and belly, are yellowish-white; the disk on the buttocks, and the longish hair of the tail purer white: all the legs are of a bright ochre colour. The animal measures about three feet at the shoulder and croup, the form of the joints and limbs indicating great powers and activity; the shanks or cannon bones of the hind-legs are longer in proportion, than in other ruminants of the

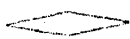

same stature; the pasterns are high, and the hoofs remarkably low and black; the texture of the hair is thick, coarse, flattened, undulating, and deciduous*.

It does not appear that the characters of the female have been observed, excepting that it has horns like the male. The species inhabits the borders of the Missouri, the north-western territory of the United States, and, according to Dr. Harlan, the great plains of the Columbia. It is described as wonderfully fleet, and darting over the plain without stopping or looking round as occurs in many of the African species.

The *Palmated A.* (*A. Palmata.*) Whether the animal here noticed be a real species or only a variety of the preceding, is a question as yet undecided. In the paper before alluded to, a pair of horns are described and figured, still measuring eleven inches along the curve, although they are partly injured at the base. They are no doubt the same which M. de Blainville ascribed to his *Cervus Hamatus*, notwithstanding that they are perfectly hollow, two inches and an half across in their greatest diameter by one inch and a quarter in the shorter; their shape is greatly compressed at the anterior and posterior parts into a sharp edge, and the substance a hard, black, and brittle horn, with the surface strongly pearly and striated for about seven inches upwards. Anteriorly, how-

* There is a small increase in my dimensions compared with those of Mr. Ord taken from the same specimen; but although I noted them while a friend made the measurements with an inch tape, I suspect the error on my side. The despatch of a traveller should in this case give way to the more leisurely observations of a resident of known accuracy. Dr. Harlan, however, *Faun. Amer.*, page 251, describes the flanks as black, probably from an error in the press, and the reddish mane on the neck is not in my notes nor in my figure.

ever, soon after its origin, the blade widens as it ascends, until it terminates into a broad, compressed, leaf-like, obtuse, deflected, striated, and pearly process turned inwards; the posterior part from this bifurcation assuming a round, taper, and regularly-uncinated form, larger, more turned inwards and pointed than in the preceding. Upon and near the ridge which unites the leaf-like part to the after horn, there are on each side one or two small knobs or buttons of horn, above one-third of an inch high, resembling incipient ramification.

By the expedition to Baffin's Bay the native region of this animal is determined, and the probability of its being a second species increased. In a head, several horns, and a mutilated skin, which we have seen, the differences between this and the former appears to be in the constancy of the elongated lozenge  which the section of the horns presents, whereas a similar section of those of *Furcifer* shews a compressed oval  in the width and early commencement of the leaf-like process, its internal direction and the rudiments of others, in the posterior curve being much larger and more turned inwards, the horn being also more voluminous in proportion to the animal, which, however, is described as very like *Furcifer*, but lower and more robust about the limbs. The head which we saw was shorter, wider across the orbits, and the nose almost straight. The fur appeared more soft and woolly, with a mixture of hoary hair, little or no white about the face or lips, but more on the breast and belly: thus approaching by the characters of the horns to the *paucos parvosque ac teretes ramos*, and the *Pilo cano* the designations of Hernandez, who, perhaps, described the winter dress*.

* The skin which we saw and the head were probably in the summer habit from the period of time when the specimens were obtained: the winter dress is doubtless more hoary. We are

The Palmated Antelope inhabits the bleak regions near the Frozen Ocean, the fragments above described being brought from Baffin's Bay, from whence the species seems to extend to the Stony Mountains and the river Jaune. Excepting the characters of the horns, no dissimilitude sufficiently marked is observable in this notice to fix a positive difference of species; but we think them nevertheless sufficient, especially as the present is a mountain, and the former a champaign animal, to leave the descriptions under two separate heads until the question can be cleared up in a satisfactory manner. Considering the high latitude which the palmated species inhabits, we are tempted to view the flattened processes on the horns as a provision of nature, perhaps to shovel the snow off the mosses and lichens upon which they must principally feed, in a country where other vegetation, and even the birch is very rare, if, indeed, the assertions of the Indians with regard to the similar practice in the Moose and the Caribou can be sufficiently relied on. From the circumstance of the Palmated Antelope residing in the mountains, it is probable that the Kluche Indians consider this as the *Kistuhé*, or Little Elk. Though small reliance should be had on names, which often have no specific meaning, even among more polished nations, the American Indians, living solely by the chase, are, nevertheless, usually deemed remarkably correct in their ideas of animals, and the Kluche from whom we obtained our information shewed that in his person the observation was correct*. In the west of North America,

aware that in the zoological part of Captain Parry's voyage the two species are considered as one; but the distinction in the horns not being referred to, and the above materials having been examined by us, our former opinion is strengthened instead of weakened.

* We asked if he knew the white-feathered bird of prey, whose pinions adorn the hair and the spears of the Indians? He answered immediately, that the bird was among our drawings, and turning

about the fur establishment of Carlton House, the Indians reckon two *Deer* indiscriminately, named Apeesce Mongsoos, or Little Moose; and they are further distinguished by, 1. Athee-Neethoo Apeesce Mongsoos, or real Little Moose; and, 2. Kin-waithoos, or Kin-way thoo weyo Apeesce Mungsoos, or Long-tailed Little Moose; but whether these names are applicable to the foregoing species, to Rein-deer, or to species of our group of *Mazama*, cannot at present be determined.

THE AIGOCERINE GROUP.

This and the following group might be viewed as forming one genus, divisible into three subordinate racemi, by characters which are observable through the whole; but we have already stated the principles which guide our preference to retain them as genuine antelopes. The Aigoceri are distinguished from all other groups of the genus, by the large stature of the species, the elevation of the interscapular vertebræ, and the fore-legs being somewhat higher than the posterior. The horns are large, robust, annulated, and bent back, as in the Ibex, standing rather near the orbits, and rising vertically from the forehead, with the annuli most prominent towards the front, and reaching upwards to about two-thirds of their whole length; the rest smooth and pointed: they are invariably black and common to both sexes. The nostrils are placed near a widening half muzzle; a white streak passes before the

them over, pointed to the tail of the Ring-tailed Eagle, saying, that they were always obtained from the tail of that bird. It was with the drawing before him that he recognised the Prong-horned Antelope, and observed that in the figure the horns could not shovel the snow, which in the valleys of the Stony Mountains, lies often, according to his account, ten feet thick. We were at that time unacquainted with the palmated species, which it now seems he had in mind.

inner canthus of the eyes, obliquely down the face; these are not provided with a lachrymary sinus: a mane of more or less length runs in a reversed direction along the neck: the tail descends to the houghs, and is terminated by a tuft: long hairs hang from the throat, and even from the chin, assuming in some the form of a beard. The hide is black, independent of the colour of the hair, the ears are long, the legs without the slender elegance of other groups, but the whole of their structure remarkably powerful and sinewy.

The group is confined to South, and probably Central Africa, frequenting the scattered woody districts and the desert, sometimes retiring to the forests, and living in small families, headed by an old male.

In the highly-interesting travels of Messrs Denham and Clapperton, into the interior of Africa, mention is made of flocks of wild animals called Korookoo, by the Bornouese, and by the Arabs, El Bucher-Achmer, the Red Bullock, noticed as found in all the woods. They have immense horns, and are something between the Ox and Antelope. One had "spears struck at him without number, but he effected his escape, carrying off several sticking in his flesh." It is not improbable that the *A. Grandicornis* is here meant, but we regret the conciseness of the notice.

The *Blue Antelope*. (*A. Leucophaea*.) The Blue Antelope, or Blauw. Bock of Kolbe, was formerly not uncommon in the vicinity of Swellendam, in the Cape colony, but now so rare, that no specimen has been killed in South Africa since the year 1799. Mr. Allaman first described and figured it from the spoils of one shot by Colonel Gordon, under the wrong name of Tseiran, or Dzeren, which belongs to a smaller species of Asia. It is an animal of considerable beauty, four feet high at the shoulder, and above six feet in length: the horns are slightly compressed, and assume the curve of a scimitar,



THE ROAN ANTELOPE.

AQUINA. Cuv

measuring twenty-eight inches along the curve: at the base they are closely wrinkled, numbering from twenty to thirty annuli, without appearance of striæ; the ears are long and pointed, gray at the back, and white within: a white spot passes before each eye, extending downwards towards the mouth; the forehead and chaffron are dark gray, as also the anterior part of the legs: the inside of the limbs is white: but what distinguishes this animal most, is the silvery blue-gray of his coat, occasioned by the hair, which is rather long and coarse, lying sparingly scattered upon a shining black hide, which is also the cause why the beauty of this colour fades into a duller gray after death, the skin becoming browner with drying.

There is a short mane of reversed white hair on the neck, and the muzzle is black; but the beard ascribed to it by Kolbe is more doubtful, because not observed in the figures or specimens, though it is not improbable that the long hairs composing it are inclined to drop out from the skins, or perhaps only remarkable in the rutting season, and wanting in the females.

The manners of the species are totally unknown, and the horns are rare in cabinets of natural curiosities. The only specimen now known is in the Museum of Paris, whither it was brought, we believe, from the collection of the late stadtholder of Holland. We possess a drawing of the individual, which, however, is far inferior in beauty to another which we copied from the original drawn by Colonel Gordon, a duplicate of which appears figured in the works of Count de Buffon.

The *Roan Antelope*. (*A. Equina*.) This species exceeding the former in stature by five or six inches, and measuring about eight feet in length, is, nevertheless, so nearly allied to it in form and characters, as to have been suspected of being only a variety, but upon a close examination, the differences are sufficiently evident. The

horns are very stout, but something shorter, the curve backwards commencing nearer the base is more sudden; they exceed two feet in length, marked with wrinkles at base, and from seventeen to twenty-seven complete rings, having the superior third smooth: they stand closer together than in the preceding, and more remote from the orbits; the ears are more than nine inches long, and the hair of the body is long, undulating, coarse, and rather scanty, forming a gray more or less of a mixed reddish and white. Under the throat the hair is still longer, white, and hanging down; a streak formed by a pencil of long white hairs, passes across the anterior angle of the eyes, and the white spot extends in some round the orbits; a spot on the forehead, and the region round the mouth and muzzle, are also white; the rest of the face, cheeks, and outside of the ears are bright chestnut or red; on the neck there is a low ridge of white hairs turned in a reversed direction towards the head. The belly is white, and the tail reaching to the houghs, about twenty inches long, and the tuft at the end dark coloured; the legs are of a dirty ochre, and the hoofs black, and both broad and long.

This description, taken from the specimen presented by Mr. Burchell to the British Museum, differs slightly from that of Messrs. Cuvier and Geoffroy, who first gave an account of the species, from that of Paris. Their specimen however, is inferior in preservation, and even in stature to the pair which Mr. Burchell brought to England, but older by the superior number of annuli upon the horns which amount to twenty-seven, whereas the British have not more than nineteen and twenty-one true rings upon theirs: these also have the hair longer and looser, forming confused clouds and fleabites of brown vinous-red and white. The larger measures from nose to tail, seven feet three inches; at the shoulder about four feet four inches in height; the tail and tuft, one foot six inches; the horns

along the curve, one foot nine inches ; the distance between them at base, one inch and a half, and at the tips, one foot ; the ears nine inches and a half.

That enterprising and scientific traveller discovered his specimens while in search of the Takhaitze of Mr. Daniell, upon the most elevated plains and hills which divide the waters of South Africa in the vicinity of Lec-takoo. They are said to live in pairs, or small troops of four or five together, keeping chiefly among the scattered open woods about the sources of the Gareep.

There is a horn preserved in the Museum of Paris, resembling those of the two preceding species in its general characters, but probably of an animal still undescribed. It is exceedingly heavy and thick at the base, three feet five inches and a half long, and marked with forty-eight or forty-nine annuli. No memorandum indicates from whence it was brought, and as several unknown fragments of a zoological nature have been formerly introduced into France from its establishments on the west coast of Africa, it is possible that it came from thence, and, perhaps, belongs to the Empalanga, Empabunga, and Empalunca of Purchas, De Bry, and other authors and travellers. De Bry represents this animal as similar to an ox, excepting that it carries the head and neck erect like a stag, and is armed with long horns knotty at base and the points turned inwards. In another place the horns are said to be straight, only bending slightly inwards at the tips*.

The *Great-horned Antelope*, *Antelope Grandicornis* of Herman, is another which may belong to the same animal, if we judge from the horn described by that learned pro-

* De Bry. *Regnum Congo*. page 22. Icon. in prima parte Iconum ad Indiæ orientalis partem 11.

fessor, in the *Observ. Zoolog.* i. 88. It is stated to be fifteen inches in circumference at base, two feet and a half long in a straight line, and three feet and a half if measured along the curve. It is erect, the point bent back, compressed, rounded behind, carinated and rough; on the internal side smoother, and separated from the back by an obsolete ridge, through which, the summit being smoother, oblique wrinkles ascend, and along the external surface, furrows more numerous but less deep descend*. This horn was brought in 1795-6, from L'Orient in France, and conveyed to Sweden; it was probably obtained through the commercial relations of that city, from the west coast of Africa, and may also be suspected to have belonged to the Empalanga or Wadan, if both names do not refer to the same animal; which also the Korookoo of the Bormouese may designate.

The *Takhaitze*. (*A. Barbata*.) Among the unsatisfactory indications of names and horns, we have another species to notice, figured under the above denomination, by Mr. Daniell, in his *African Scenery* and there said to be in stature, general conformation, and colours like the Blue and Roan Antelopes. It has been surmised that, in fact, the Takhaitze was no other than the above, and this probability was increased by Mr. Burchell searching in vain for the present animal where it was said to exist, and finding in its stead the Equina already described. That animal when seen at a distance, appears rufous, and, in fact, among Mr. Daniell's original sketches, we have seen one of this animal so coloured; but we are assured by his surviving brother, that the long mane, the beard, and the character of the horns is the same in all the

* I must here observe that my version is taken from a MS. so illegibly written that I am not sure of the correctness of the above translation from the Latin. It is not improbable that *A. Grandicornis* belongs in reality to our proposed genus *Dumalis*.

original drawings (for there are several), and considering the acknowledged fidelity of the figures designed by the late Mr. Daniell, the most natural inference seems to be that it is a new species, distinguished by a flowing mane of a dark colour; a dark beard under the chin, and having horns less vertically placed on the head, less curved, marked with fewer annuli, and, as it would seem, almost united at base. It is further distinguished by wanting the tuft of hair at the end of the tail, and by a white streak which passes down the face: the colour of the hair is bluish on the back, passing to rufous on the belly and limbs, and as before observed, in one of the original drawings, rufous all over the body.

These characters would seem to suit the Fish-tail or Lerwea of Shaw, but, we believe, that these names are nevertheless more applicable to the mountain Argali, *Ovis Tragelaphus* of Geoffroy, as we shall endeavour to shew in the sequel. Although Mr. Burchell did not find the Tak-haitze in the quarter where it is reported to reside, it may be observed that the absence of certain animals from districts in which they had previously resided, is not unprecedented, particularly in South Africa, where the variations of the wet and dry seasons, cause migrations in several species of ruminants, and along with them of certain Carnivora who prey upon them. With the excess of one or the other of these seasons, they not uncommonly make their appearance in parts of the country where they were previously unknown, and in like manner withdraw for several successive years, or altogether, from others where they used to abound. It might be the Takhaitze which was already noticed at the Cape, under the name of Baas, or Bearded Ox, many years before the travels of Dr. Somerville and Mr. Daniell; it was reported to have shorter horns, with a beard under the chin and on the breast, and to be of a gray colour: larger than an ox, and residing to the

north, beyond the limits of the colony. This description would have induced us to affix the name of Baas for the specific designation of the Takhaitze, if it were not more likely to be referrible to the Brindled Gnool.

THE ORYGINE GROUP.

Although the name of *Oryx* may be derived from the same early Caucasian root, which has left its traces in the Sanscrit and Teutonic *Urox*, it seems, nevertheless, to be legitimate Greek, implying majesty or beauty, and to have been celebrated among the ancients, without being altogether well understood. Aristotle was informed that the animal had cloven feet, and only one horn. Pliny adds that the hair is reversed. Oppian represents the *Oryx* as large and fierce, with white hair and black cheeks, having long horns, very sharp, and hard as iron : with these, he is said to contend successfully against the most powerful animals. Strabo and Lampridius observe, that offensive weapons are made of them in Africa, which will pierce even the skin of an elephant ; and Herodotus, that they served to make musical instruments. In all these accounts, some species of *Oryx* is always evident : even in the Aristotelian story, we find this animal is intended by the subsequent repetitions of the same assertion to the present time. As we have already seen, Bochart notices an unicorn by the name of *Pantalops*, which is only the word *Antholops* disfigured. There exists a rare English print belonging to or intended for some work we have not been able to trace, which represents an unicorn, in every respect resembling the *Oryx*, excepting the horn. The pretended Unicorn of Bhootan, we shall find to be referrible to the group we have under consideration, and the notice of Mr. Ruppel appears again to refer to *Oryx*. In the letter of that adventurous zoologist, written from Ambukol in Central Africa, he describes an animal from the account of a slave

born at Koldagli, who states it to be the size of a cow, having the elegant symmetry of an antelope, with reddish hair, a white streak on the forehead and nose, bearing a single horn on the forehead, long and straight, and the female to be hornless. In Mr. Barrow's travels, we have another figure of the head of an unicorn, which may still be of the present group; and in the collection of original sketches of the animals figured in one of the caverns of South Africa, designed by Mr. Daniell, the group represents very obvious outlines of Hartbeests and other animals, and among them a whole length of an unicorn: but here we find most decidedly a pachydermious creature, such as a rhinoceros would be, if his proportions were reduced into a slighter and more elegant form, and the horn on the forehead lengthened to a slender figure*.

The Romans saw the Oryx in their games as is attested by Martial, and we have shewn that even the straight-horned species was known to the English Heralds of the fourteenth century. In all probability the Dante or Lampt of Leo Africanus and Marmol, figured in the collection of voyages by De Bry, belongs to this group. The White Antelope, with lyrate annulated horns rode by the goddess Chandra in Hindu Mythology, and which appears to be the Ruru of the Sanscrit writings, and of the *Institutes of Menu*, must likewise be referred to Oryx. From an authority not cited, J. Mayor, in the *Ephem. Cur.* viii. (1677), first described the Bezoar as procured from these animals; and Mr. Pennant was well informed when he asserted an Oryx to exist in Egypt, for the figure of the animal is found among the ancient hieroglyphical representations in the tombs of the kings.

* It is to be wished that Mr. Daniell would publish this curious drawing which has a distant resemblance with the Onager Aldrovandi, as figured in Johnston, table xi.

The group is distinguished from others of the genus by its large size, having long horns, common to both sexes: they are slender, without ridges, sharp pointed, and black, with annuli somewhat spirally turned about half or two thirds of their length; the ears are long; the eyes large, dark, and prominent, the suborbital sinus almost obliterated; the nostrils ovine or without a muzzle; the tail, including the tuft, descends to the houghs, and the hoofs are mostly rather broad. The head is narrow if seen in front, and rather square in profile, the horns following the prolongation of the plane of the face; the neck and withers have the hair reversed in most species, and the shoulders are rather elevated; the legs are firm and well proportioned, without tufts on the knees, or inguinal pores?; the females have two mammae. A mane runs in general along the ridge of the neck turned towards the occiput. The general colours of the group are rufous-grays and vinous yellowish upon a white ground, which predominates more or less. All the species have a streak of white and a darker next it, crossing the eyes, and upon the upper arm and haunch. The species which frequent the woods seem to have the hide of a white colour, as in *Aigocerus* and those of sandy plains black, although the fur be pure white. The calves are born of a reddish colour, which becomes whiter as they grow up. As species or varieties, this group is dispersed over an immense extent of territory, perhaps from the borders of China, but certainly from the Moultan, through Southern Persia, Arabia, over the deserts of Northern and Middle Africa to Senegal, and south to the Cape of Good Hope. Their great strength and swiftness, aided by their ability to feed on arid succulents and thorny shrubs, are sufficient to account for the vastness of their native regions.

They live in pairs: sometimes it is said the males have two females, who with their young constitute families of

live or six together. Some species prefer mountains and elevated woody countries; others the plain and sandy deserts, where they seem to subsist with very little water. Strong, active, and vigilant, they repel the Hyæna and the Jackal; they can even intimidate the Lion. If assailed or driven to defend themselves, they raise the tail, couch their ears, toss the head with a menacing look, and with a tremulous and shrill warning snort, drop their head low between the fore-legs, inverting the horns to near the ground, and dart with incredible velocity upon their enemy. Oppian, the modern Arabs of the desert, and the Hottentots, agree in describing the danger of approaching them before they are totally disabled. We have seen spears manufactured by the natives of South Africa, armed with the horns of the Oryx, which proves Strabo's account to be perfectly correct.

In the nomenclature and synonyma of the group, Buffon, Pallas, and other systematic writers, have caused great confusion. Kämpfer's Pasau or Paseng, the *Capra Ægagrus*, has been confounded with them. Prosper Alpin's figure of the horn of an oryx has been refused an Egyptian origin, and Strepsiceros of Pliny, sometimes referred to the Cretan Sheep, applied to an animal which the ancients have not known, although we shall shew this species under the name of Addax to belong to the group now under consideration, and to have been justly pointed out by Caius in Gesner. Mr. Pennant, impelled by the same desire of ascribing all the references of authors to the species known in his time, most unaccountably considers the Caffrarian or Cape Oryx as the Egyptian Antelope. To conclude: so late as the year 1816, we find the *Dict. des Sciences Naturelles* evincing the obscurity which then still enveloped the present group. It is, perhaps, worth observing, that the Arabs and other natives of the climates which these animals inhabit, never consider them as Antelopes, but as

species of buffaloes*, an idea which they extend to other ruminants usually classed among the larger species of this genus, and which we refer to our genus *Damalis*. The Dutch colonists of the Cape alone have fancied some resemblance between their Oryx and the Chamois of Europe, and named it Gemsebock.

The *Caffrarian Oryx*. (*A. Oryx*.) The specific name Oryx was most unquestionably bestowed on the wrong animal; for we have seen that Oppian describes it as white with black cheeks, and, therefore, that he understood the Leucoryx of the moderns, and not the species which is now before us. The adult male is about three feet ten inches high at the shoulder, and six feet six inches in length; the horns are straight, about three feet long, annulated two-thirds from their base with from twenty-eight to thirty-three rings. In the females they are smaller, and in old specimens the base is considerably widened; the length often exceeds three feet, but instead of being straight, they have a slight bend backwards, and the tips again forward. In these, the annuli are nearly obliterated, but they are always black, shining, and sharp pointed, placed near the summit of the frontals on the same plane as the face, and not very divergent. The eyes stand high in the head, the colour of which is white with a black space round the root of the horns, descending down the forehead and chaffron, and another passing through the eyes towards the corner of the mouth, whence a band of the same colour passes round the head over the nose, giving the whole an artificial appearance, as if it were a head-stall. In the young and females these marks are neither so distinct nor regular: the ears are rather open, interiorly white and edged with a black line; a black list passes likewise from the

* The Chinese Nicu Kyo Po or Flying Cow, with one horn only, remarkable for its swiftness and love of salt, is probably an Oryx, if not the Leucoryx or the Kemas.

back of the head, along the neck and spine to the tail, which is of the same colour together with the tuft, and reaches to the houghs; a broad dark band surrounds the upper arm, then passes in a narrower line along the flanks, dividing the blossom colour or vinous yellow of the body and neck from the pure white of the belly, and expanding about the lower thigh into a broad dark space, surrounding the limb just above the houghs. On all the legs below the joints there is another dark space, leaving the rest of the extremities pure white; the hoofs have their points somewhat prolonged, and, together with the spurious hoofs, are shining black.

The Caffrarian Oryx is an animal of remarkable beauty and vigour, inhabiting the mountainous forests and rocky regions of Southern Africa. They live in pairs, are vigilant, and particularly in the rutting season, or when wounded, exceedingly fierce. From the information of a friend, we learn, that having fired at one on the edge of a forest, the animal instantly turned upon his dogs, and transfixed one before he fell. When pressed in their escape towards cover, they will strike to right and left at the dogs with their pointed horns, and often wound them severely; but when they have reached the edge of the wood, they will sit down on their hams, and in that attitude keep the pack at bay. Their venison is said to be the best of any in South Africa.

The female is not more than three feet six inches at the shoulder, and more delicately made. Of the period of gestation nothing is known. We have compared eleven specimens, and a great variety of spoils and horns; the most perfect stuffed one is in the Museum of the Missionary Society of London. There is as yet no good evidence that this species is found to the north of the Equator, although it must have been known anterior to the Portuguese voyage round the Cape of Good Hope, if we admit the

exact representation of the straight horns in the Prayer Book of the Duke of Bedford before-mentioned, as evidence to the fact. This prayer-book was probably illuminated on his marriage with Anne, Princess of Burgundy, and in no case can be later than the period of his death in the year 1435.

The *White Oryx*. (*A. Leucoryx*.) Mr. Pennant first published a description of this species, derived from a figure of the animal, drawn from life, in the year 1722, by order of Sir John Lock, at that time agent of the Bengal East India Company at Ispahan: several were then kept by the Shah, Sultan Hausein, in his park of Cassar. The traveller, Vincent Marie, noticed another at Muscat, in Arabia, and the species appears to be not uncommon in the province, and even the Island of Bahrein, and along the coasts of the Persian Gulf, Dr. Flemming having possessed one brought from Lesha, the capital of Bahrein. It appears to exist also to the eastward, along the western deserts of the Indus to Candahar, and the Moultan. It is the true oryx of Oppian: the Antholops of Eustathius, sporting on the banks of the Euphrates, seems to be no other; nor can the other names of the middle ages already noticed, nor the Great Goat mentioned in some MS. copies of the Shah Named, be considered as deriving their original type from any other species.

The White Oryx is in size about three feet seven inches at the shoulder, with the head rather thick and square, the neck short, the body bulky, and the legs slender. The horns, as in the former, are placed close together, diverging straight along the prolongation of the face, and the points bending back into a curve; they are obliquely annulated about two-thirds from their base, the tips smooth; they are round, black, and polished, measuring near three feet in length. From the base of the horns, the forehead is covered with a patch of black hair, uniting by a nar-

lower line to a second which spreads over the chaffron to near the nostrils ; a similarly-coloured streak passes through the eyes towards the mouth, and often spreads over the cheek and throat ; the dark colour appears also in the form of a band on the upper arm, or spreads downward over the fore-legs to near the fetlocks ; the hind-legs, from the houghs downwards, are likewise dark coloured, but upwards, on the lower thigh, this colour passes into brown and rufous, till it is blended into the white which spreads over the whole body, neck, and face ; the tuft at the end of the tail is black, the ears are long and pointed, and the aspect of the animal is somewhat vaccine.

This species is known to the Persians by the names of *El Walrush* and *Bukrus*. The Arabs name it *Ghau Bahrein*, or the Ox of Bahrein, from whence it appears to be a stranger in the western provinces of that peninsula*. Their residence is in the desert and sandy districts ; we have seen the head of one shot on the west side of the Indus, in the deserts of the Mekran.

The *Nubian Oryx*. (*A. Tao*.) Whether this animal be a distinct species, or only as a variety of the former, we cannot determine, but certain it is that the Numidian forms at least a very distinct race. The adult male is larger, being near four feet high at the shoulder, and seven feet in length from the nose to the insertion of the tail ; the horns are three feet four inches long, more robust, more spirally annulated, and equal in their curve the whole length ; the anterior part of the nose is more blunt, the neck not so short, the body less clumsy, and the limbs, though finely turned for strength and speed, more bony ; the hoofs are low, flat, and not pointed. In the colours they differ also, being all over the body rufous white, that colour predominating chiefly on

* The *Yachmur*, which, according to Niebuhr, inhabits the mountainous tracts of Arabia and about the Euphrates, the same as the Arabic *Yazmur*, is evidently the present animal.

the nose, temples, cheeks, neck, upper arm, and lower part of the thigh to the joint, and the white over the shoulders, back, flanks, and croup: there is a very slight indication of black above and beneath the eye, but a broad pure white streak descends on each side of the forehead before the inner canthus of the eyes, to the corners of the mouth; the nostrils and legs are white, as also the reversed mane, and the tail, including the tuft, the extremity alone being blackish; the edge of the buttocks, down the houghs, and the anterior part of the thigh, the belly and legs, are likewise of a white colour; the ears are shorter than in the preceding, and white. This description is taken from the beautiful specimen in the Museum of Frankfort, whither it was sent, as we understand, by M. Ruppel, from the interior of Western Nubia, being shot at some days journey's distance from the Bahar el Abiad.

This species or variety is probably the *war*, *Toa* or *Tao* of the Hebrews and Egyptians; it is found portrayed in the hieroglyphic representations in the tombs of the kings, and seems to be also the species designated by the Tuaries and Tibboos near the great desert south of Tunis, as a small white buffalo, swift and fierce when wounded, noticed by Captain Lyon. The Dante or Lant of Congo, figured in De Bry's collection, and described as of the stature of a small ox, sub-rufous in colour, vigilant, active, and bold, is perfectly applicable, and the notice of Leo Africanus still more so. He represents it as a species of ox, but smaller, with more elegant horns and legs; of a white colour and with black hoofs; so exceedingly swift, that a Barbary horse alone may overtake it: more easily caught during the summer heats, because the hoofs wear on the burning sands and impede its speed. We must remark here that the references to the size of cattle in Central Africa are arbitrary, several breeds being small. The colours of rufous and white are both applicable to the animal, and

we may add that Buffon, in noticing the above passage of Leo, seems to have been misled by a wrong comma, making the legs of the animal, instead of the size, less than that of an ox.

The *Algazel* *. (*A Bezoastica*.) This is, perhaps, a third variety, though M. F. Cuvier considers it a species. If this opinion be correct, it follows that the animal described by him under the above name, being a native of Western Africa, has usurped the specific appellation which should have been conferred upon the foregoing according to Zoologists, because that is known on the banks of the Nile, while this appears to be more confined to the regions of the Niger and Gambia. M. Schreber first published a figure without a description, under the specific designation of *A. Eleotragus* which is in reality that of the Rietbock or *A. Arundinacea*. The Icon itself may be referred to the present species, though the pale bluish and rufous tone of the colouring and other particulars, might prove it to be intended for the female of *Leucophaea* †. Professor Lichtenstein first pointed out the probable identity of this supposed *A. Eleotragus* with *A. Bezoastica*, and M. F. Cuvier seems to have been of the same opinion. To the latter gentleman we owe the only accurate account of the species.

The *Algazel* is very considerably less than the former species, being only three feet five inches high at the

* *Al gazl* is evidently misapplied, as *Gazl* signifies a young deer, a roe, in fact the true *Gazelle*; but modern Zoology has affixed it to an *oryx*.

† A horn in the possession of Mr. Parkinson is very like those in this figure. It is compressed, more bent than those of *Bezoartica*, about twenty inches long, slender, black, not quite complete at base, but retaining twenty-seven obsolete annuli; the lower dichotomous and with striae between them, the superior third, smooth, and pointed. It does not belong to *Oryx*, but may be of the female of *Leucophaea*.

shoulder, and five feet two inches long. The horns are about three feet long, close together at the base, black, round, slender, bent back, the lower half annulated with thirty-six rings, not spirally ascending, but separate; the forehead is narrow, the head long, with a small lachrymary sinus not much developed, beneath the eye; on the neck and back a low ridge of reversed hair, and the colour of the body fulvous-gray, whiter on the back; the head white, with a dark spot at the insertion of the horns, descending down the nose, and another passing through the eyes; the tail white, with the termination of the tuft dark: this description was taken from a male which lived in the Menagerie of the king at Paris, where we made a drawing of it in 1819.

The animal wanted that elegance and vigour in its proportions so conspicuous in the Numidian species: in captivity it was gentle, or more properly, spiritless, almost sluggish. The ears, which in comparison to the former were long and pointed, usually hung in an horizontal spreading direction; the Museum received it from Senegal, where it was said to be rare, and imported from the interior. From the specific name this should be the Bezoar, bearing animal; but we have already stated our opinion that the former is, in truth, the animal which naturalists intended to honour with this title; and as these concretions are in all probability not more the property of one than the other species, and the medicinal virtues of the Bezoar not the object before us, we shall leave the consideration to pharmacy, its proper place. We presume it to be the species met by Major Denham south of the river Shary.

Count de Buffon figures a horn without rings, but in all other respects belonging to this group. We have seen a similar horn in the hands of a dealer at Leipsic, three feet



six inches long, perfectly smooth, bent as in the former, and in volume something more considerable. These may belong to an unknown species, but it is presumed that they are mere indications of age, with, perhaps, the aid of art; and as we have now before us a horn of the Caffrarian species nearly in the same state, this conjecture acquires the weight of certainty.

With the *Orygine* group we class a subordinate *racemus*, more anomalous in characters, but still osculating with it by the position of the horns on the frontals, their length, slender form, and terminal point, and their community to both sexes—the insignificance or absence of the lachrymary sinus—the ovine nose, large stature, and even by the marks on the face,—yet assuming other characters which lead to the succeeding groups.

The *Addax*. (*A. Addax*.) The first impression on seeing this animal is that of an oryx with spiral horns, and upon examination this impression is not weakened, although Caius in Gesner, de Capris Silvestribus, figures the horns, and assigns them, with justice, to *Strepsiceros*. Nomenclators have, in this instance, misplaced that name, and given it to one which the ancients appear not to have known: the words of Pliny prove that he did not mean the creature of Southern Africa, at present distinguished by that designation, and still less that he meant to indicate the Cretan Sheep. His (*Cornua*) “*erecta rugarumque ambitu contorta et in læve fastigium exacuta, ut Lyras diceres*,” is not perfectly applicable to either of the above, but completely to the animal before us. Hence we have no hesitation in adopting the name of *Addax*, which the Roman naturalist gives as the local one of his *Strepsiceros*, and in adopting on this head the opinions of Professor Gratzmer. Shaw seems to have known only the horns of

his Ledmee, and may, therefore, be suspected to have mistaken this animal for the true Antelope, although it must be owned that their length of two feet is no objection, and that there are grounded reasons to doubt the exclusion of that species from Africa. In the zoological part of Messrs. Denham and Clapperton's Voyage, the Addax is clearly mistaken for *A. Cervicapra*, for the Arab name El Buger Abiad, or White Cow, at once reveals it.

The Addax differs from the true Oryges by having the croup somewhat more elevated than the shoulders, and by a lengthened mane on the neck, and a tuft of hair beneath the throat. Its stature is about three feet seven inches at the shoulder, and three feet eight inches at the loins: the horns are equally robust in both sexes, black, round, divergent, slender, with thirty-two or thirty-five annuli, some of the lower dichotomous, extending upwards three-fourths of the length; they form two and a half spiral turns, with an obsolete groove on the internal side, obliterated midway towards the point, which, with about five inches of surface, is smooth, sharp, and turned outwards: they stand close at the base, near the summit of the frontals, on the same plane with the face, five inches in circumference at the root, two feet four inches long, in a straight line, and nearly the same distance between the tips; the eyes are prominent, and without a lachrymary sinus; there is a dark-coloured mane on the neck, hanging in various directions, and a heavy, coarse, and long tuft of black hair upon the larynx; the head is thick, the forehead flat, covered with frizzled black hair, surrounded by a narrow white line, descending from above the eyes, and meeting on the chaffron, then passing obliquely before the inner canthus of the eyes to near the mouth; the nose is ovine, and, with the lips and chin, white; the ears long, hairy, and of the same colour; the region about the orbits, the chaffron, cheeks, and neck, are of a deep liver-coloured gray, pass-

ing gradually into white upon the shoulders, from whence the whole animal, including the tail with its terminal tuft, and the legs, are milk-white ; the limbs are firm, and rather stout ; the hoofs low, flat, round, and black, resembling somewhat those of the Rein-deer : the tail does not reach to the houghs. The female has two mammae, no inguinal pores, and appears, in all other respects, like the male.

The first indication of this species occurred to us in 1819, while viewing the Museum of Bourdeaux, where we found a horn of Addax, which was there mistaken for one of Cervicapra, and had been brought from Senegal*. Upon the measurement and description of this fragment we established the species, and found it fully confirmed in 1824, when the complete specimens were placed in the Museum of Frankfort. We are indebted to the liberal institutions of that splendid establishment, formed by the public spirit of the lovers of science in that city, and in particular to the kindness of Professor Gratzner, for the means of drawing and making measurements of many new and interesting zoological specimens. Several of both sexes of the Addax were sent from Nubia by M. Kuppel. It appears that they reside in pairs on the barren deserts ; their broad spreading hoofs seem intended to facilitate their progress over yielding sands, and their powers enable them to extend over the whole Zahara, so as to be found as far west as Senegal. Along with the above specimens we found the complete spoils, skin, and skull of a calf, which it is presumed belonged to this species, and was obtained at the time with the female, whose mammae indicate that they had milk when she was shot. This little creature is higher on the legs than an adult goat, with hoofs very low and flat, the horns little more than an inch long, and the colour of

* Dr. Caius communicated to Gesner a drawing of the head of this species, though it has been mistaken by zoologists for that of *A. Antelope*.

the hair pale rufous. It resembles a new-born Guernsey calf, and might, indeed, be the young of the Nubian Oryx.

The *Chiru*. (*A. Kemas*?) The Kemas of Ælian is only characterized by horns with the point turned forwards, a hide very thickly set with hair, and a white tail. Naturalists, viewing the direction of the points of the horns as a decisive criterion of groups, have mostly placed this species among the Reduncæ, and considered it an African species, without adverting that the quantity of hair and the colour of the tail removed it from any known animal of this genus, belonging to that quarter of the globe, or even from those of Asia hitherto described. No ruminant of a low latitude, or residing beneath high mountains, is furnished with a superabundant coat of hair; and thus we are led to look for the Kemas of Ælian among those remote from the tropics, or whose habitat is confined to elevated regions, and to consider it as still undescribed in the catalogues of nomenclators. Assuming the foregoing data, a late discovery in the mountains of Central Asia shews us an antelope in which the indications of Ælian are obvious; we mean the *Chiru* or Unicorn of the Bhotes. From the accounts which we have received, and the inspection of the horns by a friend, we are enabled to present a notice of this animal sufficiently distinct to establish it as a species, the probable Kemas of Ælian, and to indicate its presumed affinity with the *Orygine* group, at least until subsequent observation shall have confirmed or invalidated the opinion.

The materials from which the notice is collected, consist in the description of the skin of a male to which the horns were attached, but mutilated and distorted from the want of skill or of means in the natives who procured it, and also in several horns sent from Katmandoo to Calcutta. From these it appears, that the total length of the animal approaches to six feet, and the height at the shoulders is more than three feet. The horns are from twenty-one to

twenty-six inches long, black, slender, annulated with rings, most prominent towards the front, and extending three-fourths up the horn, the rest smooth and pointed; they are seated on the crest of the frontals, parallel to the plane of the face, close at base, divergent; their general direction between straight and lyrate, and the tips turned forward; the head is ten inches long, seemingly without lachrymary sinus, and without a moist muzzle; the ears are short; the neck, compared with the body, very long, if at least this seeming disproportion be not the result of overstretching that part; the fore-legs and withers are lower than the croup; the tail is eight inches long, and shaped as in the Axis; the hair of the animal is rough and very thick, but not quite so hard or long as in the Musk, with much of the same quill-like character: it conceals a fleece of fine soft wool, set very close, and pressed against the skin: the colour of the face and legs is dark, nearly black; the neck, back, and sides, blue-gray slate colour, turning to rufous on the back; the belly, inside of the thighs, and tail, are whitish; the distinctive characters of the female are unknown.

We have here another instance of wool on the skin of an antilopine species; a character not only perfectly consistent, but of necessity, when the animal resides in high latitudes, or on high mountains: thus a similar cause produces a similar effect upon the *A. Lanigera* of North America, the Chiru of Central Asia, and, indeed, on the Chamois of Europe. This wool is so abundant, that in the notice sent from Katmandoo*, it is described as perfectly similar to that of the Wild Sheep of Bhote. It is probable that the residence of this animal in the same regions, and sometimes in company with the Thibetan Musk, led the

* A MS. extract, for which I am obliged to J. E. Gray, Esq., of the British Museum.

Arabian and Bysantine writers to consider it as the musk-bearing animal; and this error was the more likely to occur, as they might have known the Mongolian Dzeren (*A. Gut-turosa*), who is actually provided with a pouch. Of all the antilopine animals, the Chiru is the one which corresponds best with Ælian's Kemas*; and if we consider that although the species is described at present as found in the Bootan, the mountain ruminants are more likely than those of the plain to spread along the ramifications of central ridges as far as they can find a congenial climate. There is no reason to deny its former and probably present existence, even in the Caucasian range, and to have come within the inquiries of Ælian, during the military expeditions of his time (that is of Alexander Severus) into the mountains of Armenia†. The species might still have remained unnoticed in the elevated wildernesses of Central Asia, if the people of the country had not asserted it to be the Unicorn, and since the specimen is produced, insisted that it is often found with only one horn. No doubt all the Oryges are liable to break one of their horns, when we consider their length, small diameter, and the vigour and courageous disposition of the animals; and we may infer that the reports of Monocerotus so ancient, so universal, and so permanent, depend solely upon these accidents; and that the

* Although the word Kemas, Κεμας, appears a genuine Greek term for a young ruminant, the derivation seems rather far-fetched, and it is, possibly, in common with other Greek terms, derived from the more ancient Oriental root *Kem*, which, with its mutations, signifying summit, crest, &c., extends over the Old World. There is a curious connexion between the ancient names of the great ranges of mountains and of ruminants. Thus Taurus, and Tanrus a bull; Himalaya, Hemala a ram, the Teutonic Haniel; Imaus, and Hæmus and Kemas; Caucasus, and Chau-cas, or Oxridge; Coomri, and Komri, a doubtful Hybrid of Central Africa, &c.

† Ælian's description of its swimming and residence in woods is more appropriate to Asiatic than African locality.

A. subulata nob.



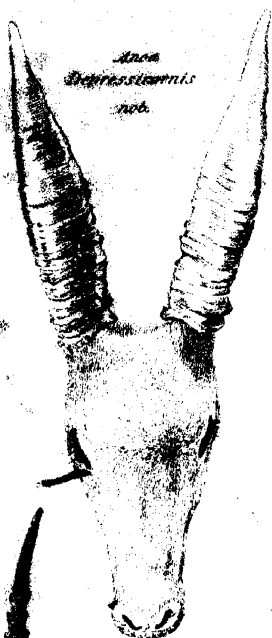
A. Acuticornis
Blain.



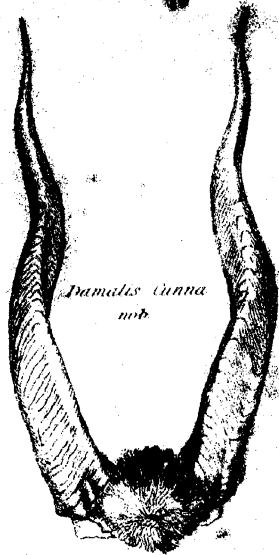
Lotophanes apollinaris



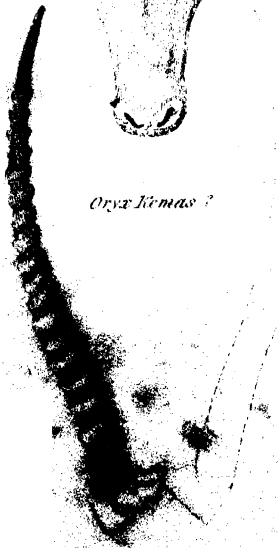
Arca
Depressicornis
nob.



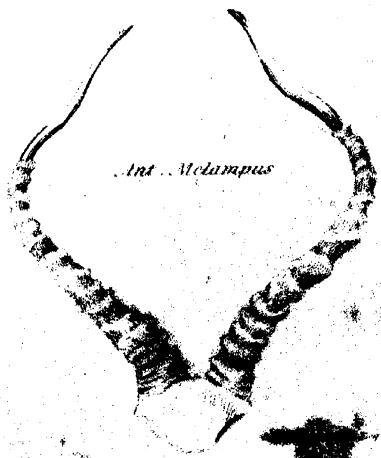
Damalis cinna
nob.



Oryx kienias ?



Ant. Melampus



Unicorn Chiru of Bhote is, in all likelihood, the Unicorn of the ancient Persians.

According to the accounts of the natives, this species resides in the most inaccessible pine tracts of Chandang, north-west of Digurgu, in the Himalaya mountains, on the verge of the snow, and evinces great activity and vigilance. They associate sometimes with the Musk, and with the Nervati, or Wild Sheep of Bhote. Mr. Hodgson, assistant resident of the East India Company at Katmandoo, first produced the documents for a description of the animal ; there were, however, already some accounts of it transmitted in a letter from Captain Smith, who commanded a party stationed in the eastern parts of Nepaul. In the *Calcutta Oriental Miscellany*, are the dimensions of the skin, before noticed, and communicated, we believe, by Mr. Hodgson. Total length of the animal five feet eight inches ; of the head ten inches ; of the ears four inches and a half ; of the body four feet two inches ; length of the neck one foot nine inches ; of the fore-leg one foot eight inches ; of the hind-leg one foot eight inches and a half ; of the tail eight inches ; circumference of the head one foot eight inches and a half.

It appears, from the information of friends, that the term spiral horns, which was at first assigned to it, refers to the annuli, which are obsolete, excepting in front ; and from the figure shewn us, we are inclined to consider a horn in the collection of Mr. Parkinson, attached to a part of the frontal, and formerly belonging to the Leverian Museum, as of this species. It is about twenty-seven inches long, measured upon the curves ; black, slender, very slightly lyrated, parallel with the face, bending outwards towards the middle, and the tips turned forwards ; marked with twenty-one annuli, most prominent in front, striated between, and with about five inches of the summit smooth. It is seated on the crest of the frontals, and may have been the horn which induced Mr. Pennant to describe his Cine-

reous Antelope, or *Eleotragus* of Schreber, as having the points turned forward. We had placed it in the group of *Oryx*, with the surmise that this referred to *Kemas* in our original catalogue. There is, however, a slight difference, the present having a small lateral bend, which we hear does not exist in the *Chiru*. If, therefore, it does not belong to the *Bhote* species, it is a fragment of one not as yet described.

THE GAZELLINE GROUP.

Of the great genus *Antelope*, there appear to be two parallel lines of affinities, descending, with trifling interchanges of subordinate characters, down to the lower groups included in it. The first with horns in both sexes, passing from the *Aigocerine* *racemus*, through the *Gazellæ*, and the second from the *Oryges*, through *Antilopodes*, to *Reduncæ*, *Cervicapræ*, *Cephalophi*, *Neotragi*, *Tetraceri* and *Raphiceri*, till we arrive at those which depart from the slender structure of the former, and gradually assume more the characters of *Capra* and *Ovis*. In connecting, therefore, the series by the gradations of character, either might be selected, as through the *Addax* a natural passage is formed to the Spirally-horned Antelope and through *Oryx* or *Kemas*, a similar osculation takes place with *Pallah*; but as in the groups of *Antelope*, and their connecting links, the females are hornless, it may be deemed preferable to follow in the first instance the *Aigocerine* series, by means of *A. Pygargas*, through the *Gazellæ*, and then taking the *Antelopes* connected, both with the *Oryges* and *Gazellæ*, immediately after them, continue that line till the *Antilopine* type becomes confounded in the *Caprine*. The *Gazellæ* have the females provided with horns, and the structure of these arms, particularly in the larger species, offer curves more decisive indeed, but still of a similar primitive direction as in the *Aigoceri*. The annuli are

most prominent to the front, but they are placed lower down the frontals, nearly above the orbits, bending more outwards, and the tips turn in general again forward, so as to assume the shape of an ancient lyre, when the head is seen in front. This instrument may be regarded as originally composed of the horns, and the frontals connected with the cerebral cavity of the skulls of Antelopes, the strings being passed from a cross-bar at their tips to some part of the molars in the upper maxilla, or to a second bar thrust across the orbits: this primitive form may be recognised in all the subsequent modifications of the ancient lyre.

The *Gazellæ* have the bony cores of the horns solid; they are provided with a small lachrymary sinus, and with inguinal pores; most of the species have tufts on the knees, a streak of a dark colour, set off by a lighter streak through the eyes, and a dark band separating the darker tints of the flanks from the white of the belly; the inside of the ears is mostly marked by several dark lines, occasioned by the absence of hair, which is placed in rows, and of a white colour; their eyes are prominent, dark, and soft, and it is to this group in particular, that the complimentary allusions of the oriental nations is confined; the nose is ovine; the females have four or two mammae developed, and the tail is short and furnished with a dark tuft.

The larger species live in families or herds, but the smaller are all gregarious, keeping at a distance from wooded scenes, and residing principally on the barren deserts; these, however, they will quit in the night, to approach cultivation, and it is said, that in the desolated provinces of Abyssinia, they are fond of resorting to the fields, where the result of former agriculture has left abundance of grain growing wild, to seek cover and food, and thus concealed, they are hunted with difficulty. The Arabs and Bedowens of Africa and Western Asia, some-

times shoot them by watching their approach to the springs, or hunt them by contriving to get suddenly among a herd, and throwing a heavy stick horizontally at the nearest, and generally breaking the legs of one or more. The nobles in Persia, and the wealthy Turks and Moors pursue them with the Hawk, or slip the Cheetah or Seer-ghoosh * to surprise them ; but in all these cases, even when the Hawk is flown, it is necessary to circumvent the quarry, unless the herd is so large as to exceed the bounds of alarm, or it would be labour in vain to reach them. Although they feed most about dawn and twilight, wandering travellers sometimes come suddenly in the night upon a herd, and it is observed, that if no dogs be present, they will scarcely rise and go further than a short distance to lie down again ; but if unusual noise disturbs them, the whole trot off and evince symptoms of anxiety till the return of day-light. During the ill-fated expedition to trace the course of the Zezeere or Congo, the devoted travellers saw many herds of Antelopes of various and new species, chiefly belonging to this group, some of which were obtained, but only a few trifles and short notes reached England †.

The *White-faced Antelope*. (*A. Pygarga*.) This species is the largest of the group, retaining somewhat of the Aigocerine aspect, but marked by a most singular intermixture of colours. In height at the shoulder, it is superior to the Stag of Europe ; the horns placed sub-vertically on the frontals, a little above the eyes, are bent, first convexly or to the front, then slightly concave, the points being turned upwards ; they are black, extremely strong, with ten or twelve semi-annuli on their anterior

* Cheetah *Felis Venatica*, Sechar or Seer-ghoosh, (head or chief thief,) the Syagush or Persian Lynx ; it also signifies long ears.

† Dr. Smith's notes were sent to his relations at Christiania, and those of Mr. Cranch are unfortunately in a particular short hand, hitherto undeciphered.

side, separated by striated intervals; their length is from twelve to fifteen inches, and their circumference at base seven inches; about two inches of the point are smooth. They are seated on a fiery rufous patch of hair, larger in some, and in others, divided by a white streak which passes down the whole length of the face; the ears are long, reddish outside, and white within; the sides of the head, neck, throat, shoulders, upper arm, flanks, croup, and thighs to near the joint, are of a deep brownish-purple, or sanguine colour; but it is remarkable in this species, that the back and upper part of the shoulders appear as if a heavy bluish-white was glazed over the purple under tone, forming a broad space in the shape of a saddle: this mark is separated by the deep-purple on the flanks, from the pure white which extends over the belly; the anterior and internal side of the thighs, the inside of the arms, the breast, legs, buttocks, and tail, are likewise white, a short dark-coloured tuft at the end of the last-mentioned only excepted; the legs are clean and firm, with small hoofs exceedingly black. The largest specimen we have seen, measured three feet eight inches at the shoulder, and was full six feet long: the distinctive characters of the female are doubtful. Among nine specimens, the horns and colours, independently of those whose sexual characters could be distinguished, were all nearly alike, and appeared to be of males, though it is possible that among the mutilated, some were females: yet according to Shaw, the horns of the females are nearly smooth.

This animal does not seem to be known in Central Africa. It is found in the regions bordering upon the colony of the Cape of Good Hope, and within the frontier about Swellindoun and *Breederivier*; among the Dutch colonists it is distinguished by the name of Blessbock, descriptive of the white mark on the face; and the Booshaanas name it

Nunat. Their manners are somewhat akin to those of the Gnou, living in families of seven or eight; and further north, even in small flocks. There is a variety which we have seen, brought from the Boochwana country, in which the white colour on the buttocks is not observable, but the white legs remain equally pure as in the others, and the purple and glazed colours of the body are still more brilliant.

The *Broad-hoofed Antelope*. (*A. Mytilopes*.) Dr. de Blainville is the only author who has published a notice of this species under the name of *Antelope Neztache** (*A. Naso Maculata*), from a specimen in Mr. Bullock's late collection, and now in the British Museum; but his description is very imperfect, no doubt, from the impossibility of obtaining a close inspection of his subject. It is a female evidently allied to the former by several characters, but considerably smaller, being only four feet two inches in length, by two feet eight inches at the shoulder; the croup two inches higher. The head is nine inches long, concave between the chaffron and forehead; the horns, one foot in length, have the same direction as in the former, but the flexures are less strongly marked; they are round, black, annulated, with thirteen or fourteen rather indistinct rings extending little more than half way up, the rest smooth, standing on a square spot of a vivid rufous colour; the ears are six inches long; the suborbital pore not perceptible, and the nostrils with a small dark space or muzzle between them; the rest of the forehead, region about the eyes, passing into a broad bar under the ear, and into another bar

* This specific denomination appears very objectionable, because the animal is possessed of distinctive characters much more essential, clearly marked, and applicable to it alone; whereas the spot on the nose is faint, of the same colour as the cheeks and sides, and therefore no spot.



THE BROAD-HOOFED ANTELOPE.

GAZ. NTILOPE.

before the eyes, the lips, under jaw, breast, belly, all the legs, the thighs, and croup, are white; the chin is furnished with bristly hairs, and of the same colour, as also the tail, the end of which is mutilated; the chaffron, cheeks, neck, shoulder, flanks, hips, and part of the buttock, are fulvous-ochre colour; the withers and back a whitish-gray, glazed upon the under tint, forming an ephipiform spot similar to the preceding; the ears are white within, and very pale fawn on the outside. There are small naked callosities below the knees, and a dark-brown spot embraces the insertion of the spurious hoofs; but the broad, flat, muscle-shaped hoofs, expanding nearly an inch laterally, and terminating forwards in two long and rounded points, distinguishes this species from every other. In this species four mammae are developed, and it is probable that the same character extends to *Pygargus*. The body is heavy compared with others of this group, and the form of the hoofs indicate a peculiar mode of life, perhaps on the sandy deserts, as we have seen something similar in the *Addax*.

We understood the specimen to have been brought from Guinea, or at least from Western Africa. The male is as yet unknown, but it may be conjectured, that, excepting in stature, more robust horns, and a more brilliant coat, little difference will be found between them.

The *Red-necked Antelope*. (*A. Ruficollis*.) There is so much similarity in the distribution of the colours, and even in the horns, between this species and *A. Dama*, that their possible identity requires an osculating location among the Antelopes. The species under consideration is about three feet high at the shoulder, of a light and elegant structure; the head rather broad across the orbits, tapers to a small mouth with ovine nostrils; the horns are near twelve inches long, with thirteen or sixteen small annuli, the superior third smooth; they are lyrate, with the tips turned inward and forward; beneath the eyes there is

a small lachrymary sinus; the ears are above six inches long, and the tail is short, and terminated by a tuft. Exactly upon the knees, there are brushes of a peculiar structure, being formed of two rows of stiff bristly hairs, perpendicular upon the edges of the joint, and turning inwards, which meet and lie close on the middle of the knee. The head is white, with two spots of bright rufous hair at the base of the horns, descending on the forehead to the commencement of the chaffron; the ears inside, and at the base of the outside, are white, from the middle upwards rufous, and the tips black; the neck, shoulders, and back, to the loins, are whitish rufous, darkest on the neck, but leaving a white spot on the throat; the rest of the body, breast, limbs, and tail, excepting a rufous spot on each of the fore shanks, are milk-white, so that in this species the saddle-shaped space on the back differs from the former in the colours being reversed; the tail is terminated by a tuft, but does not reach below the hams.

The female is a little smaller; the horns are less curved, particularly at the points, which, in the male, bend strongly to the front: the rufous colouring is also paler, and there is a little blackish-gray upon the larynx. We found only two mammæ in this species; the inguinal pores were large, naked, and bright yellow; the spurious hoofs very small, the pasterns high, the true hoofs small, low, pointed, and black*. This beautiful species resides on the barren wastes of Nubia, where the specimens were procured by M. Ruppel, and sent from thence to the Museum of Frankfort.

The *Swift Antelope*. (*A. Dama*.) Count de Buffon described this species under the name of Nanguer, from a skin brought by Mr. Adanson from Senegal. The speci-

* With the haste of a traveller I omitted to note the number of incisor teeth, but believe they are as usual eight. If Pallas be correct respecting *Dama*, this would constitute a difference.

men was two feet high, three feet nine inches in length; the colour reddish-dun on the back and neck; the head, ears, belly, flanks, tail, and legs, white; a dun streak ran down the fore-legs from the knee to the fetlocks. There was a rufous spot at the base of the horns, and a large white spot on the throat; the horns were about seven inches long, black, round, bent back, and the points turned forwards; the annuli, if any, were indistinct. In this description, the inferior stature, small horns as yet without discernible rings, the rufous colour on the fore-legs, &c., bear evidence of nonage, this being the semi-adult of the former; but whether Pliny meant this species by his *Dama*, is more doubtful, because in the adult, the flexures of the horns, though terminating with the point forwards, are not more so than those of the Kevel, which it is more likely that he knew. It is equally questionable whether *Ælian* meant this species by his *Dama*, which undoubtedly is as swift an animal as any of the genus, and, therefore, well named by Mr. Pennant, but still it seems not likely that the ancient naturalist should have characterized the fleetness of its course by a comparison with the awful velocity of the whirlwind.

Dr. Pallas observed that this species has only six incisor teeth, but if the statement be correct, it may be accidental, there being in the Royal College of Surgeons another head shewing only six alveoli, but, not being provided with horns, it cannot belong to the same species, and there being only five molars in the upper jaw, with other evident signs of nonage, the circumstance may be entirely owing to the youth of the specimen. Mr. Adanson found the *Nanguer* * in Senegal; if his specimen and *Ruficollis* be the

* Adanson's names of *Nanguer* and *Nagor* (*passim*), are evidently different modes of spelling and pronouncing the *Bornou*, *Engry*, and *Begharmu Ngria*, which, according to *Denham*, signifies *Gazelle*.

same, the name of the latter must of course be struck out of the list, and *Dama* alone retained; and it follows also that then the species will extend from the Nile to Senegal.

The *Springer Antelope*. (*A. Euchon*.) This beautiful animal is the largest of a small subordinate group, several of which seem to have been noticed by the ancients indiscriminately under the name of *Dorcas*, originally applied to the Roebuck. The Springer resembles the *Dorcas* of nomenclators, but is nearly a third larger in size. The head is rather short, with somewhat of the expression of a lamb; the neck is slender, the body comparatively bulky, and the legs slender and elegantly turned. In common with the rest of the *Dorcades* the croup is more elevated than the shoulders; this conformation appearing to increase in the inverse ratio of their stature, for *Pygargus* has the line of the back horizontal, and *Corinna* and *Cora* the croup most raised; *Mytilopes* shews it in a small degree, and the Springer more. Independent of the difference of relative size, we may take the greater development of the hind quarters as an index of the comparative powers of bounding and velocity of motion: but the character most remarkable and unique in the Springer, consists in two folds of the skin ascending from the root of the tail, and terminating upon the croup; they dilate when the animal is bounding, and expose a large triangular space, otherwise concealed, of pure white-coloured hair, edged by two dark streaks, which form the covering borders. The general colour of the hair is a pale fulvous dun; the face, mouth, inside of the ears, breast, belly, posterior part of the legs, tail, and croup, within the above-mentioned space, white; the end of the tail is furnished with a few black hairs; a broad dark-brown band divides the white from the fulvous along the flanks, from the elbow to the hip, and another separates the white colour of the buttocks, ascends on the edges of the folds on the croup,

and terminates in a point upon the ridge of the back, at the junction with the band from the opposite side: a small dark-coloured streak passes also through the eyes, or commences at them, and reaches down to near the nostrils, and the horns are placed on a bright fulvous scalp; these are robust, and handsomely lyrated in old males, with about twenty narrow complete annuli, and the tips turned inwards or forwards. In the females they are slender, and the annuli less prominent. It is to be remarked of this species, that while the males are young, and their horns shew only twelve or fourteen annuli, the points generally turn forwards; but in proportion as they increase in length, the apex turns more inward, and the annuli assume the form of large wrinkles. This observation proves the anterior uncination of horns to be either insignificant or a transient distinction in many species, and in all probability is equally applicable to *A. Dama*.

The Springer is known among the Dutch Colonists of the Cape by the names of Spring Bock and Pronk (showy) Bock*. It resides on the plains of South Africa, to an unknown distance in the interior, in flocks, assembling in vast herds, and migrating from north to south, and back with the monsoons. These migrations, which are said to take place in their most numerous form, only at the intervals of several years, appear to come from the north-east, and in masses of many thousands, devouring, like locusts, every green herb. The Lion has been seen to migrate, and walk in the midst of the compressed phalanx, with only as much room between him and his victims as the fears of those immediately around could procure space by pressing outwards. The foremost of these vast columns are fat, and

* The Caffer name Tesbe has a singular resemblance to the Hebrew Tzebi, which is commonly understood to designate the Dorcas.

the rear exceedingly lean, while the direction continues one way; but with the change of the monsoon, when they return towards the north, the rear become the leaders, fattening in their turn, and leaving the others to starve, and to be devoured by the numerous enemies who follow their march. At all times, when impelled by fear, either of the hunter or the beast of prey, darting among the flock, but principally when the herds are assembled in countless multitude, so that an alarm cannot spread rapidly, and open the means of flight, they are pressed against each other, and their anxiety to escape, impels them to bound up in the air, shewing, at the same time, the white spot on the croup dilated by the effort, and closing again in their descent, and producing that beautiful effect from which they have obtained the name of Springer and Showy Bock.

Though Sparrman seems to have first described it in a satisfactory manner, the species must have been known, and even brought alive to Europe at a much earlier period, there being a good representation of this animal in a picture of the Creation by the Velvet Brengel, who died about 1689. We have compared six male and two female specimens. It appears that albinism sometimes affects the colour of the fur, for in Paris there is a specimen of a white colour, retaining, nevertheless, the dark bands on the flanks and croup, the streak near the eyes, and the fulvous spot on the region of the horns, but the horns seem never to have been developed, although the individual is somewhat larger than the usual size: there is also a slight indication of rufous on the arm and on the hind-legs, and the tips of the ears are black.

The Persian Antelope. (A. Subgutturosa.) The Dorcades are considered by many eminent naturalists, and seemingly with some reason, as including within one species, the Subgutturosa, the Dorcas, the Kevella, and Corinna. There is, in truth, so much similarity in their size, horns,



and markings, that it will, perhaps, be necessary to obtain these species collectively, and to compare them more minutely in their habits, than has been done, or can well be effected by the casual examination of living individuals and stuffed skins; but if they be of the same species, we think, nevertheless, that they form, most decidedly, distinct races, which inhabit the same countries, but seldom or never intermix, and that the presumed identity may be ascribed, in a great measure, to their general resemblance, most particularly in the transition of nonage to maturity. These remarks are, however, only in part applicable to the Persian Antelope, whose habitat is confined to a range of latitude where snow is found, at least, during some period of the year, and whose characters, in several particulars, are sufficiently remote from the others to be considered as a separate species.

This animal is known to the Persians by the name of Tzeiran, and to the Turks by that of Jairan. In size it is about the same as the former, measuring three feet seven inches in length, and above two feet at the shoulder. The horns of an old male are from thirteen to fifteen inches long, measured upon the curves; they are grayish-black, lyrated, from the base spreading forwards and outwards, then bending inwards turn their points again outwards and backwards, and sometimes into a hook: they are marked with about nineteen rings, some of which are interrupted, extending two-thirds of the whole length, and leaving the points smooth. In the skull there are no openings or void spaces between the nasal and lachrymal bones, and the superorbital perforations are small and single, not double or triple, as in other Antelopes: such are the characters of a skull in the collection of Mr. Brooks. M. Guldenstädt, however, in the *Act. Acad. Petrop.* describes the horns of his specimen as shewing the basal annuli very close, and the others more separated, and almost obliterated at the

back ; in ours they are distinct all round, and the middle rings only divided by small intervals. The eyes are large, dark, and soft ; the ears long, straight, and marked with the usual triple striæ ; the tail is about five inches long, lined with distichous hairs, and the larynx is prominent, protruding in the form of an egg ; the colour of the hair is fulvous gray ; brown on the upper parts of the body ; the face ochery ; a brown mark occupies the middle of the nose, and a whitish line each side of the chaffron, succeeded by a dark streak from the inner canthus of the eyes to the corner of the mouth ; in old specimens these marks are effaced : the lips are blackish ; the throat and legs pale ochre colour : there is a darker band on the flanks, sometimes separated from the colour of the back by a paler streak ; the tufts on the knees are of a mixed whitish and black hairs ; the tail and hoofs are black ; the hair of the back is near two inches long. The females have smaller horns ; they are destitute of lachrymary sinus and of tufts on the knees ; their mammæ are placed on a naked surface, and the inguinal pores distil a scented substance.

This species is an inhabitant of the open sandy plains and hills of Northern Persia, Asia Minor, Southern Siberia, and the shores of Lake Baikal. It is gregarious, and feeds in preference on the *Absynthium Ponticum*. The Persians and Tartars hunt it for the savoury venison it affords, both with the Hawk and the Cheetah. We presume this to be the Brown or Mountain Gazelle of Russel and Haselquist, reported to be so fond of the smell of tobacco, as to approach shepherds while reposing with their pipe, and come almost in contact. This species would then be found as far south as Aleppo, but probably only in the colder season.

The *Barbary Antelope*. (*A. Dorcas*.) The *Barbary Antelope*, or Δορκας of Ælian, is the غزال Gazal of the Arabs, and, perhaps, the צבי Tzebi of Scripture. It is in stature a little less than the Roebuck ; the horns are round, black,

lyrated, about thirteen inches long, annulated at base, semi-annulated in the middle, with twelve or thirteen bars; the points smooth and sharp, slightly turned forwards, and the sides of the horn striated; the forehead and chaffron form a slight concavity, rufous in colour, with a little black in the middle, separated by a white or fawn-coloured streak, extending from the orbits to the nostrils, and succeeded by another white and black streak, passing from the inner angle of the eyes towards the nose; the lower half of the orbits, and part of the cheek, are likewise fawn coloured, or whitish; the inside of the ears is marked by five alternate streaks of white and black; the eyes are remarkably large, black, and beautiful; and the mouth and inside of the nostrils are black. The general colour of the animal is pale fulvous, reaching down the anterior and external side of the legs; the lips, nose, breast, belly, inside of the thighs, posterior part of the legs and buttocks, white; the tail is short, furnished with a tuft of long black hair; a broad dark-brown band separates the fulvous of the side from the white of the belly; there are small tufts of hair below the knees, and inguinal pores in the groin: the female is furnished with more slender horns, whose points are turned inward, and with two mammæ. We have examined thirteen individuals of both sexes of this species, several of which lived in the Menagerie of Exeter 'Change. They were all brought from Barbary and the Levant, the Dorcas seeming to be confined to the north side of the Atlas Mountains, Egypt, Syria, Arabia, and Southern Persia: they are gregarious, from choice or necessity, keeping on the open and often desert and sandy plains, approaching water only once in twenty-four hours, and that in general at the dawn of day.

The *Kevel*. (*A. Kevella*.) This species or variety, when fully adult, is equal in size to the Dorcas, distinguishable from it by the head being a little more lengthened, and the

facial line straighter; the horns are considerably more robust, laterally compressed, longer, the flexures more complete, with from twelve to twenty annuli extending nearly to the summit, and the points bent forwards slender and sharp; the orbits are larger; the eye still fuller, and of an hazel colour; the white space round the eye is broader, and the same colour extends to the under jaw; the colours on the forehead and chaffron are fulvous, and the streak on the inner angle of the eyes fulvous-brown, with no really black intermixture; and though the disposition of the colours of the hair in other respects be nearly similar, the white of the buttocks is usually divided from the pale fulvous of the thigh by a faint darker streak, even when no dark band is seen on the flanks, which seems to be the sign of old age.

It appears that the Kevel is not found on the north side of the Atlas, unless it be on the west coast of Morocco: it forms large herds along the plains of Central Africa beyond the river Congo, and probably as far south as Caffra-ria. In Mr. Burchell's private collection we saw a skull belonging to the female of either this or the young male of *Corinna*; for, notwithstanding the resemblance, the female of *Euchon* is readily distinguished. We have compared two living and five stuffed specimens of the Kevel, and particularly one old with the oldest among the *Dorcas*, and our inferences are in favour of the opinion that they are distinct species. The horns of the female are almost straight, excepting at the tips, which turn inwards; they are slightly compressed, and marked in front with seven or eight half annuli; the number of mammae the same as *Dorcas*.

The *Corinna*. (*A. Corinna*.) The third questionable species is the *Corinna*, confounded on account of its close affinity with the two former, which is indeed so near, that the young females of the latter, and especially of *Kevella*, are mostly placed in the collections of Mammalia for specimens of the

Corinna. Mr. Adanson's original description, noticed by Buffon, appears to be the sole document which can be relied on, Professor Lichenstein, justly observing that the specimens referred to in cabinets, including Buffon's, are all females. M. F. Cuvier's more recent description and figure relates to the same sex, and is taken from one brought to France, from Senegal indeed, but so young that the horns have not as yet sufficient development, and the markings retain their juvenile character: it may, therefore, be considered as a female Kevella, and ranked with the other specimens as before observed; but although the genuine Korin of Central Africa is not among the articles exhibited in Europe, it does not follow that there is no such creature; the question merely resolves itself into, Whether the Korin be a separate species or a constant variety or race of the Dorcas and Kevella, resulting from a long residence on the most barren plains and the most scorching climate. The Korin, or Corinna, does not approach the coasts of Western Africa, but is exclusively confined to the plains of the interior bordering on the Sahara. The late captive and traveller Adams alludes to this species "with slender straight horns and dark bands on the flanks, running in troops on the desert."

The only specimens which can, however, be fairly referred to Corinna, were exhibited alive in London; both the male and female, by the development of their horns, proved that they were adults. The male was not so large as the Kevel; the horns more recumbent at their base, slightly tumescent at first, were regularly lyrated, but with less contour in the curves, and about seven inches long, closely wrinkled beneath, and with slight risings in the middle, but not sufficiently prominent to decide either wrinkles or annuli. The points were turned a little inwards, they stood not very close at the base, a little above the orbits, and were bent outwards towards the summits

more than in the Dorcas or Kevella; the nose and mouth were white, which colour passed upwards to and round the eyes; the chaffron bright fulvous, as also a small space between the eye and nose separating the white line from the cheek; the forehead, back of the ears, cheeks, neck, back, outer part of the upper arm, and middle of the thigh, were sandy or pale ochre, fawn mixed with a little gray towards the flanks; the inside of the ears marked with three streaks; the breast, belly, inside of the limbs, anterior pasterns, anterior edge of the thighs, buttocks, the whole hind-legs and under part of the tail, were white; small darkish tufts protected the knees of the male; the upper part and tuft of the tail, which was still shorter than in Kevella, were blackish, and a chestnut-coloured band ran along the flank. The female was smaller, similarly marked; the horns shorter than the ears, seemed to have only a few swellings on their surface, the points, however, were turned inwards; both had very slight indications of a lachrymary sinus, their hoofs were very small and black; they were rather corpulent when compared with the usual lank appearance of this group, but too timid and liable to injury for more accurate investigation. We made sketches of this pair, which was said to have been kept some time at Sierra Leone before they were brought to Europe, and it was added that the fawns are spotted. We should not hesitate to consider these as the Korin of Adanson, if we had been able to ascertain the exact nature of the wrinkles on the horns, which, according to him, should amount to sixty; but they were distinctly marked only at the base of ours, and whether friction in captivity might not have obliterated them on the upper parts, we may presume but cannot positively determine.

The *Cora*. (*A. Cora*.) There existed a pair of small Antelopes in the tower of London, one of which was afterwards stuffed and preserved in that establishment; they

were male and female, said to have been brought from India, or more properly from the Persian Guiph; they were taken for Corinnas, but shewed distinguishing characters which make this opinion very doubtful. The male was equal in size with Kevella; the head round, with the nose and mouth small, tapering, uniting to the forehead by a concave line. The specimens were both young; the horns, not much developed, stood upon a middle line between the orbits; they were about four inches long, in the female, suberect, the points slightly bent back, smooth, round, without striæ, black, and pointed: instead of annuli a circular groove marked about the third of their length. It was near three feet two inches long, twenty inches high at the shoulder; from the nose to the horns five inches, and from the nose to the occiput seven inches and an half; the ears four inches, pointed wide in the middle, and furnished with three white striæ on their inner surface; the suborbital sinus not perceptible, and the nose ovine. A dark streak passed through the eyes towards the nose, and a second from the base of the horns to near the nostrils; the forehead and chaffron were bright rufous; the mouth and nose white, as also the space between the two dark streaks, passing over the eyes to the back of and under the orbits; the occiput dark-brown; the cheeks fawn-coloured; the outside of the ears, neck, throat, shoulders, back, thighs, and outside of the legs yellowish-rufous, or rust colour; the breast, belly, inside of the limbs, anterior part of the thighs and buttocks, white; a dark streak on the flanks; on the knees, perhaps from confinement, there was a small callosity; the tail, five inches long, was furnished with long black hair, and the anterior face of the pasterns to between the hoofs shewed a tuft of dark-brown hair; the pastern joints were very long, the hoofs small, pointed, and black, and the croup was considerably higher than the shoulders.

These individuals, though not adult, were in size above the Corinnas, before described, and larger than Mr. Adanson's noted dimensions; their colour was much more red. The two black streaks on each side of the face, and particularly a more anterior position of the horns, seem sufficient to warrant a separate place being assigned them, even if their native country were not so far east as Persia or Eastern Arabia. We have but one suspicion relating to them, which is that they might be the young of *A. Gutturosa*, but in that case the species would inhabit a latitude as hot as that of Barbary, as well as countries abounding in snow, which is not likely. Under these impressions we propose the provisional name of *Cora** as a distinguishing designation, leaving the question of identity to be settled by future investigation. It were to be wished that, instead of multiplying the species, those described might be compressed into fewer, and clearly established as mere varieties of age or locality: but there is an equal impropriety in being swayed by a desire either way so long as every circumstance connected with this history is not fully developed, and we certainly are still far short of that end: these observations apply to the whole of the minor group. *Kevella* appeared to us as the old adult of *Dorcas*, but having since seen that species with only eleven whole and half annuli, though the horns had the bolder flexures and compressed character assigned them, and *Dorcas* with fourteen complete and half rings, but the horns round and more developed, we have returned to the more ancient opinion that they are really different species.

THE ANTELOPINE GROUP.

This *racemus* is nearly allied to the former in manners and habits, in the general structure of its forms, the number of mammæ of the females, and the inguinal pores;

* *Cora*, a *κορη*, puella.

but less obviously so in the lateral bands of darker colour, and in the greater expansion of the suborbital sinus. It differs in the horns, never being truly lyrated, often subspiral or spiral, and in their total absence in the females. The group is likewise distinguished by an incipient muzzle or small moist space between the nostrils, destitute of hair, and all the species are more elevated at the croup than at the shoulders. As in the former, the larger species live in families or small flocks, on various ground, but the smaller herd in vast numbers exclusively on the open plain, concealing themselves only during parturition in high grass or weeds. The component species are spread over nearly the whole of Africa and partially on Eastern Europe and the plains of the west, and middle, and chiefly Southern Asia. Among animals of such delicate conformation no great vigour of character is to be expected; yet the males of some species have, at least, the pugnacious spirit of jealousy, and expel the weaker from the herd, retaining a degree of viciousness even in confinement. Acuteness of scent is a common property of the genus, but most particularly the attribute of this group; some of which appear to possess this organ communicating with the suborbital sinus, and to consult it on all occasions. If bread be offered them which has been handled, they will reject it; the flavour of an orange is agreeable, for they will not only smell it with the nostrils, but, willing to flatter themselves still more, they apply the suborbital pores in like manner, and seem to inhale the odour with great pleasure.

The *Pallah*. (*A. Melampus*.) This beautiful species was first figured and described by Professor Lichtenstein, who obtained a specimen during his travels in Caffraria. It is placed at the head of this group, because it is the largest. The horns have a lyrate tendency, and the females are represented by Mr. Daniel, as being without them. If

that sex had horns, the place of the Pallah would be after *Mytilopes* and before *Ruficollis* in the former section, because there is much similarity in the distribution of the colours with the latter, and in the dark spot on the spurious hoof with the former. It is an animal of majestic and graceful form. The horns of the male are at least twenty inches long, bending outwards and midway, forming an obtuse angle with the base, the upper half being turned inwards; they are strong, black, striated, prominently and ruggedly annulated, with about seventeen rings ascending two-thirds of their length, the rest smooth, and the points sharp; the height at the shoulder is above three feet, at the croup about two inches more, and the length nearly five feet. It stands high on the legs, and has a long neck; the ears are about seven inches long, white inside and on the edges, fulvous outside, and black at the tips: between the nostrils there is a bare pale coloured moist space; the mouth and lips are white, this colour passing upwards with a fawn-coloured tone round the eyes; the forehead is brown, softening into fulvous on the chaffron, and expanding this colour over the cheeks, with a dark streak below the orbits; the neck, throat, and sides, are fulvous, turning to a deeper brown upon the back and rump; the breast, inferior part of the shoulder and thighs, the belly, buttocks, inside of the limbs and legs, are pure white; a black streak, sometimes double, separating the rufous from the white on the buttocks, but a dark streak running along the spine, not always perceptible; the tail, about eight inches long, is white, and without terminal tuft; but above the spurious hoofs, at the back of each leg, there is a black spot; the hoofs are small and black, and the whole animal is a model of elegance and vigour.

The females are represented without horns, but with the ears still longer than the males; they are nearly similar in the distribution of the colours, but the rufous is less vivid.

The Pallah inhabits the interior of Caffrarea, and particularly the Boosswana country, never appearing, according to Lichtenstein, south of the Koosges Valley. They live in small families of seven or eight.

We compared the figures of Professor Lichtenstein and Daniell with three skins of males, and several heads and horns, all so nearly alike, as to prove that this species is not the Koba*; the angular bend in the horns being constant in all, and the distribution of the colours the same. In the Berlin specimen the black spots on the legs descend lower, and are larger than in those belonging to the Burchellian collection or the British Museum, and it was from these particular spots that the learned Lichtenstein drew his specific name of *Melampus*.

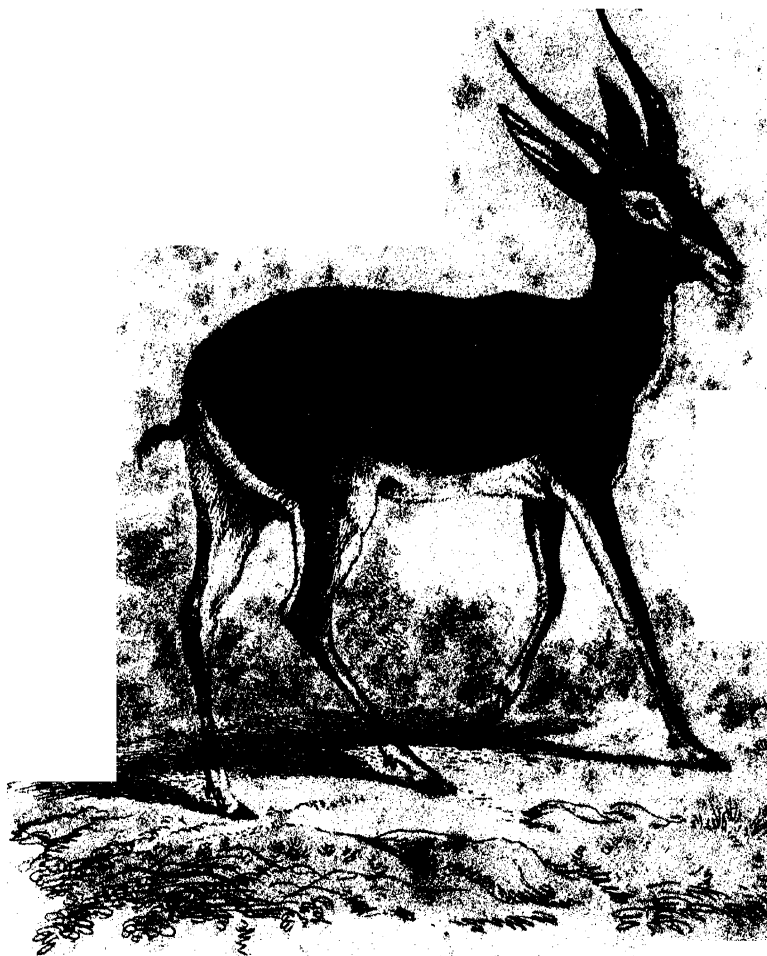
The *Gambian Antelope*. (*A. Porrex.*) This name, first established by Mr. Pennant, and by him applied to the Kob, is, however, of a doubtful nature, as it respects the species we have to notice. Gmelin joins the *Lerwia* or *Teshtal* of the traveller Shaw to it; but in order not to mislead the judgment, it is necessary to produce the characters, such as the original authors of these names have established them, and compare them with the description of our species taken from a living specimen. Mr. Pennant characterizes it thus: "horns thirteen inches long, five inches and a half round at bottom, pretty close at the base and points, very distant in the middle, surrounded with eight or nine rings, smooth in the upper part." This description is evidently taken from a pair of horns alone. Dr. Shaw, however, copying Gmelin, likewise adds the *Lerwia*, which is described by his namesake the traveller, as of the size of a heifer, is provided with a long mane, tufts of hair five inches long round the fore-legs, and re-

* Koba, it will be seen, belongs in all probability to our genus *Damalis*.

curved horns. These characters would refer to a larger animal (more likely to be the *Takhaitze* of Daniell, if there were no other considerations which we shall notice in the genus *Ovis*), but most clearly exclude it from the Gambian Antelope described by Mr. Pennant.

The specimen which we refer to the Gambian was kept in the Menagerie of Exeter 'Change, and there confounded with the rest of middle-sized Lyrated Antelopes. It was a male, larger than the Springer, being about twenty-five inches at the shoulder, rather bulky of body, but with much resemblance to *Kevella*. The horns close at the base, slightly bent forwards, then opened widely outwards, and their points again turned inwards, and slightly forwards; they were black, round, annulated, with twelve complete rings, the upper third smooth and pointed; when seen in front, they represented the figure of a forceps, and measured about twelve inches on the curves; the head was broad across the orbits, measuring ten inches in length, and terminating in a small mouth with white lips, and a black shining muzzle between the nostrils; the eyes were full and dark, surrounded by a white space, and beneath them was a long lachrymary sinus; the ears were rather large, open, and slightly pointed, lined with close white hair, and from the orifice filled with a bunch of long white and gray hairs, hanging out of their conchs between two and three inches in length*. The face, cheeks, back of the ears, neck, shoulders, back, croup, sides, external face of the upper arm, thighs, rump, houghs, and anterior face of the hind-legs, were fulvous-dun, darkening into yellowish-brown on the face and buttocks; the tail, about six inches long, of the same colour, with a black line on the middle, and a tuft of black hair at the end, the inferior part white;

* This character is also perceptible in Mr. Pennant's figure of the head, but his description of the horns is more conformable to ours than to his figure.



THE KUDU

this colour, spread also over the throat, breast, belly, anterior part of the thighs, and inside of the limbs, legs, and fetlocks: between the dun and white on the flanks there was a darker line not very distinct; a dusky streak passed down the front of the fore-legs, terminating in a dark spot on the pastern joint, and small brushes of the same colour protected the knees; on the hind-legs the dusky space reached only a short distance above the pastern; the hoofs were small, black, and pointed.

Its aspect was peculiarly soft and engaging, but it was uncommonly shy. We understood it to have been brought from the west coast of Africa.

In the Museum of Mr. Riddel there was a stuffed female in a recumbent attitude, which belongs to this or the following species. The head was hornless, ten inches long, round about the forehead, and tapering to a prolonged small muzzle; the suborbital sinus open and dark; the eye-lashes long and black; the ears lengthened oval, lined with much white hair. Its total length three feet eight inches, assumed height at the shoulder twenty-two inches, and at the croup twenty-five inches; the nose, forehead, back of the ears, neck, back, croup, and anterior part of the legs, fulvous; sides of the head, neck, shoulders, flanks, and thighs, sandy-ochre colour; a spot above the eyes, mouth, throat, breast, belly, and inside of the limbs, white; no streak, but a dark spot on each pastern; tufts on knees stiff, curling, dark-brown; two mammae: it was evidently not quite adult, and came from Africa, we believe from Sierra Leone.

The Kob? (*A. Adenota**) The animal designated by the name of Kob, is known only from the skull and horns in the Museum of Paris. Mr. Adanson first noticed it, and

* Uncertain whether this is the Kob, we wish to distinguish the present specimen by the gland on the back, *adip. glandula, varior dorsum.*

Count de Buffon drew up his account from the above fragment, with the additional information, that in Senegal it was known to the French settlers by the appellation of *Petite Vache Brune*. The horns are large, black, marked on the first two-thirds of their length with seven or eight half rings; the posterior and lateral sides striated: they form only one single curve to the front, and the points turn towards each other; the head is narrow, long, and without depressions for the lachrymary sinus. This description shews already a sufficient difference in the horns to separate the former species from *Kob*, but whether the following will be deemed satisfactory and identical with Adanson's specimen, is more questionable. The inference, however, appeared to us sufficiently grounded.

In the Menagerie of Exeter 'Change there was a pair of middle-sized Antelopes, like the former, supposed to belong to the lyrated group. The horns of the male were seated above the orbits, at base nearly vertical to the plane of the face, then bending back, and the tips almost imperceptibly forwards: they were above nine inches long, robust, black, striated, a little compressed, with the semi-annuli only on the anterior part, prominent, ten in number, the superior third smooth, but not sharp-pointed; the shoulder was about twenty-six inches high from the ground, the back arched, and the croup one inch higher; the head long, pointed, with a small black muzzle; the lips, under jaw, and space round the eyes, white; the ears long, open, with the usual dark streaks on the inner surface; the head, back of the ears, neck, back, flanks, outside of the fore-legs croup, thighs, and hind-legs, fulvous bay; a small gland or tubercle on the loins, about equi-distant from the hips and root of the tail formed the centre, round which the hair of the body whirled or feathered in a circle, couching forward on the back, and upwards on the neck, obliquely over

the flanks, downward over the hips, and backward towards the tail; the belly, internal face of the fore-legs, anterior and internal side of the thighs and fetlocks, white; a dark list ran in front of the fore-legs, terminating near the hoofs; a black lengthened spot surrounded the hind-legs above the spurious hoofs; the tail was short, entirely covered with long black hair; the suborbital slit was long and open; small black brushes covered the knees, and the hoofs were small, pointed, and black. The female was smaller, hornless, but similar in the gland on the back, the direction of the hair, and distribution of the colours; both were excessively shy, and difficult to approach. They were brought from the west coast of Africa.

We have here three successive instances of dark spots near the succentorial hoofs, a resemblance further maintained in the suborbital openings, the long ears, rufous colours, and small muzzle; but the identity with Kob would not have been obvious, if, after the death of the male, we had not obtained, from the politeness of Mr. Pettigrew, permission to make drawings of the skull then in his possession, and thus to establish the only comparison that could be deemed satisfactory, with the figure of the skull in the works of Buffon. Although the living objects just described were still young, the similarity is striking, and differs only where they differ in age. The horns of our specimen, when seen in front, resemble the points of a field fork, opening from the base, and bearing the summit nearly parallel; the skull is narrow across the orbits; the super-orbital perforations on the frontals are triple on one side, and only double on the other, each in one common cavity; the nasal bones are divided from the lachrymary by a single lengthened void; the lachrymary are not hollowed out to the depth that appears in others, and the nasals are remarkably long. We conjecture, when the lachrymary bones are not greatly depressed, and a suborbital sack is, never-

theless, extant, that it is very open outwards, other instances of the same structure having been detected. In proof of the almost nonage of the subject, there were only five molars in each of the upper maxillæ, the last narrower than the third or fourth, and all the sutures were very distinct.

The *Saiga*. (*A. Colus*.) The name Saiga, which appears to be a Slavonic pronunciation of the Teutonic Zeiga, or great, is applied to an animal truly Antilopine ; and although it be found in Europe, is one of the most rare in cabinets of natural history. There are specimens, we believe, in the cabinets of Petersburg and Vienna, but no other, that we know of, can shew more than the horns. The male has been figured by Pallas, and it is to be regretted that he did not likewise publish another of the female. Of all the Antelopes, none, if we except the Chamois, has been described so early as the Saiga. Strabo, in his *Geograph. L. vii.*, clearly noticed it under the name of *Κολος* ; Gesner and Johnston likewise described the Colus ; but Pallas, to whom we are indebted for a complete account of the species, preferred to latinize the vulgar name, and was followed, in this respect, by all the more modern writers*.

The horns of the Saiga assume an intermediate form between the lyrate of the Dorcas, and the spiral of the Common Antelope ; they are distant at base, about ten inches long, round, erect, wavy, in three curves, perfectly annu-

* We think the animal's having a proper and classical name, used by Strabo and Gesner, a sufficient apology for not following the denomination of Pallas ; there are, nevertheless, other reasons ; Saiga is the Russian name of the *female* only. Saiga is Tartaric for the Wild Ox ; and in the many dialects of Eastern Asia is the most vague of all those bestowed upon ruminants. The Polish name Sulok is, no doubt, the ancient Slavonic term, from whence the Greek Kolus, which presents the letters reversed, is derived.

lated to near the summits, which are turned inwards; their colour is yellowish and diaphanous. The animal is in size nearly equal to the Fallow-deer, measuring more than four feet in length, but not harmoniously proportioned, for the head and body are heavy, compared to the delicacy of the limbs; the nose has a turned arched form, the nostrils are open, wide, and moist, that part being wholly cartilaginous, as the nasal and vomer bones are never entirely ossified; this rare structure furnishes the exquisite sense of smelling possessed by the animal, and also causes it to graze backwards or sideways; the ears are narrow, middle-sized, and the tail short, being only four inches long, and naked below during the summer, with a tuft at the end: at this season the colour of the hair upon the back and flanks is gray-dun, with a dark streak along the spine, and white upon the belly; in winter it becomes more hoary and longer, so as to appear whitish at a distance; the lips are provided with numerous bristly hairs; and the legs, which are of a pale dun colour, have small tufts on the knees, and black pointed hoofs.

This species resides on the shores of the Danube, south of the Carpathian range, on the uncultivated parts of South-eastern Poland, Little Russia, along the Black Sea, round the Caucasian Mountains, the Aral and Caspian Seas, to the east about the Irtysh, the Ob, and the Altaic Chain, being confined to the north by the thirty-fifth degree, or less. In all this extensive region the soil is nearly everywhere steril, sandy, and salt; supporting mostly Absynthian, Artemysian, Atriplectic, and other bitter and saline plants, many of which are evergreen; these, together with the brackish water of pools, afford the principal sustenance of the Saiga, and communicate their flavour to its flesh, which, however, is considered not unpalatable in winter, but rejected in the summer, on account of the numerous Cestri, probably of a particular species, which infest and

pierce the skin, and give it a putrid smell. The females have the hair softer, and are hornless ; and the males are themselves subject to vary in this particular, some having been found with three, and others, it is said, with only one horn.

The manners of the Saiga are sociable and migratory, especially in the autumn, when they assemble sometimes to the number of ten thousand in a herd and travel towards more southerly deserts : in the spring they return in small flocks or troops. They are unwilling to reside far from water, are seldom seen single, and the herd, when in a state of repose, always keeps a few stationed to look out ; even when domesticated, this instinct remains. They see indifferently during the day, are weak and resigned when beset, and although their speed is exceedingly great, they are soon exhausted, stopping to recover breath, and perish with the slightest wound. It is reported that, like sheep, they incline on one side in their course ; they have a bleating voice. Strabo had observed with truth that they drink by the nostrils, but erred when he added that they retain water in them. Towards the end of November the males become pugnacious, as this is the commencement of the rutting season. They then smell of musk, and the most powerful buck drives the weaker from the herd, and keeps the females to himself, with jealousy and even with courage, to defend them against wolves or foxes. Parturition takes place in May, it is usually confined to one kid which at first is covered with a curling fleece-like wool. The young males grow rapidly ; their horns appear in the first month.

They are gentle when domesticated, but for this purpose they must be taken young. They will go to the fields and return without desiring to escape, know the voice of their masters, and feel gratified with his caresses. In the hay and provender they pick out the leafy plants and re-

fuse the gramineous and buds of shrubs. The Wild Saiga are hunted for their horns, which are an article of commerce with the Chinese, who manufacture them into lanterns: the winter hides are likewise useful and the flesh. For this purpose both hounds and eagles are used, but the hunters must approach them from leeward, and be without red or white clothing. Eagles and wolves hunt them also for their prey, and, indeed, are their greatest enemies. In Poland the Saiga is known by the name of Sulak, and in Russia by that of Mangatch, the female being the Saiga. In the Tartaric dialects it is commonly Saijak, and the Turks name them Akim.

The *Dzeren*. (*A. Gutturosa*.) The Dzeren of the Mongolian Tartars, Tzeiran and Jairan of the Persians and Turks, was mistaken by Buffon for *A. Leucophæa*, through a figure of the horn of the latter animal being placed at the head of the article Bezoar of Oldroyandus. The name, indeed, appears generic in the East, for the Dzeren of the Mongols is not the Tzeiran of the Persians, who designate by it, the Persian Antelope or Subgutturosa. The Chinese Antelope, or Dzeren, is like the former, heavy in body, with a short thick head armed with yellowish but opaque horns*, or as others assert, with equal probability, black horns; they are about nine inches long, completely annulated to near the tips, reclining backwards, diverging, wavy, and the points turned inwards. The nose is blunt; the lips set with long hairs; the ears small and pointed; but one of the chief characters of the animal is a large

* We found the horns ascribed to the Saiga and the Dzeren in the Prague, Munich, and Dresden Museums. If there be no mistake in the tickets, Shaw, who states them to be yellow, is correct; but it might be that they all belonged to one species (the Saiga), the smaller opaque to the young, and the larger diaphanous to the adult. Gmelin reports them to be black, and he cannot well be mistaken: the truth may be that the colours vary.

moveable protuberance in the throat, occasioned by the dilatation of the larynx, appearing externally clothed with long stiff hairs pointing forwards: in old males it is so much enlarged as to look monstrous. There is also under the belly of the male, near the prepuce, a glandulous bag, somewhat similar to that of the musk, which may have caused the old opinion that the Thibetan Musk was a horned animal, but in this bag there is no odoriferous substance. The suborbital pores are small; the females are hornless, and smaller than the males, who measure about two feet six inches at the shoulders, and nearly four feet six inches in length. In the summer both are of a fulvous yellow-gray above and white beneath: in winter they are almost white; their knees are furnished with short brushies, but not lengthened tufts as in the Dorcades; the tail is short and terminated by a dark tuft.

The species is found in Mongolian Tartary, in the deserts between China and Thibet, in Eastern Siberia, and principally on the great sandy desert of Cobi. It avoids woody places, preferring the arid stony open plains and barren mountains. It is gregarious, assembling in vast herds towards autumn, approaching the vicinity of habitations in winter, and sometimes mixing with the cattle, feeding on herbs and grasses, and rejecting the bitter and saline plants. The Dzeren is equal in swiftness with the Saiga, less easily fatigued, and in its course making surprising bounds. The rutting season occurs later than in the former, and the females drop their kids in the middle of June; these are of a slower growth, but equally tameable when taken young. In a wild state this animal fears water so much, as to suffer itself to be taken, rather than enter it; but if falling into a river by accident, is said to swim well. Wood and forest are equally an object of terror with them, probably from a conscious feeling that their bounding speed will cause them injury, and, in fact, if they be driven among trees,

they soon strike against them, and are disabled. According to Du Halde they are known in China by the name of Hoang, or Wang Yang (Yellow Goat).

The *Common Antelope*. (*A. Cervicapra*.) We now come to the most celebrated species in the whole genus, not less remarkable for beauty of form and elegant distribution of colours, than for the interest it has excited from the remotest antiquity among the nations and philosophic legislators of the regions where it resides. They have raised the Common Antelope among the constellations, harnessed it to the chariot of the moon, and represented it as the quarry of the gods. In the opinion of Hindoos the animal is sacred to Chandra, female devotees and minstrels lead it, domesticated, by the harmony of their instruments, or the power of their prayers, and holy Bramins are directed to feed upon their flesh, under certain circumstances prescribed by the *Institutes of Menu* *.

The Common or Indian Antelope is styled the Spotted or Eoa in the ancient language, and Sasin or Sasi by the modern Hindoos. It is smaller than the Fallow-deer, with a lengthened head, ending in a rather full and round mouth, surmounted by a small moist muzzle: the eyes are full, soft, and dark-hazel, with a well-defined suborbital opening beneath; the ears middle-sized and pointed; and the horns, placed a little above the orbits, are from fifteen to twenty inches long, which, as the animal advances in age, become more and more spiral, though when younger they have little more than three flexures. They begin to appear on the young males at the age of seven months, shewing the second year one slight bend, increasing the spiral curve when they have two, which takes place at three years of age, and twelve or thirteen rings are numbered on their

* The Antelope, as we have before stated, is sacred to Chandra or the Moon, is depicted in the Indian Zodiack instead of Capricorn, and placed in the hands of Mahadeva Pancha Mukti.

surface; but when they have attained three years, they contain about twenty-two complete rings. In more advanced age they thicken, at the base a succession of half annuli or wrinkles are seen, and they are sometimes two feet long; the spiral turns are then perfect, so that after death, if the osseous core within be dry, they can be screwed on and off with ease. The colours of the hair vary likewise with age: while young they are of a pale fulvous, more or less ochery, with white about the mouth, inside of the ears, breast, belly, inside of the limbs, buttocks, anterior part of the thighs, interior and posterior part of the upper arms, and the rest of the legs; a white streak passes also about midway of the fulvous along the flanks; there is sometimes a dark streak in the form of a crescent passing round the anterior part of the eyes next the forehead; when older, the white increases on the nose, forms a circle round the orbits, extends on the lower jaw and throat, and the legs often become entirely white, excepting the tufts on the knees, which are always brown; the tail, about five inches long, is likewise white beneath, brown or fulvous above, and without a tuft at the end. But the fulvous colours darken gradually, the forehead, back of the ears, top of the neck, superior part of the tail, and the middle and lower part of the thigh, to beneath the joint, alone remain fulvous; the chaffron, cheeks, throat, sides of the neck, shoulders, back, croup, and flanks, deepening into a sepia-brown, and the streak on the middle of the flanks becomes intense black, with a second of the same colour some inches lower on the edge of the white colour of the belly. It is at this period that the colouring is complete, and the term *spotted* is applied; they are then of a growth and maturity to claim a herd of females, but there are individuals, and they are the most vigorous, which become nearly all shining black and white, the fulvous being wholly obliterated; these have the horns wrinkled and solid as before noticed, and

never more than one male so marked is seen in a herd, the leader and champion of the females and the young *.

The females are without horns, and assume the same colours till they acquire the tawny or fulvous coat, which is about their fifth year, when a white streak gradually shews itself on each side of the spine, but they never acquire the dark garb of the males. There appears to be in India no fixed period for copulation. They are gravid nine months, from which considerable longevity is to be presumed. One kid is produced at a birth, too weak to rise from the ground for some days; at length it is led out from the cover by the dam, and follows the herd till the third year, when it is expelled by the jealousy of the leading buck, to wander at some distance, exposed to the grasp of the Tiger, or the weapons of sportsmen. Thus left to their own resources, many perish; the others become vigilant, and even bold. Most of the specimens procured are males of this class, but many precautions are necessary to capture them, so great is their vigilance and distrust.

We have seen several individuals together, both at Exeter 'Change and in paddocks of gentlemen. The males are inclined to be vicious at certain seasons, but the females are remarkably gentle: they lived all together peaceably with deer and sheep, walking occasionally round their fence, then skipping more rapidly, and, at length, bounding with great force and velocity; they shewed much curiosity, came towards new objects, even when terrified, and it was generally after reconnoitring something strange that their gambols commenced. Similar habits had already been observed by Pallas, in those kept at the Menagerie of the Stadtholder of

* According to Kevenot not more than five or six are led (not followed) by a male, and several of these families together make a herd. He, too, names them spotted, or like our *fawns*, which last expression makes it doubtful whether he is not speaking of Hog-deer.

Holland. Mr. Pennant remarked in this species what we have witnessed in some kinds of Deer, that they apply in smelling, not only the nostrils, but also the suborbital opening, especially to a grateful scent.

This species resides in India in herds of fifty or sixty does or females, led by a dark-coloured buck. They remain invariably on the open plains, so as to see danger from a distance. Captain Williamson and other sportsmen state, that when a herd is collected to lie down and ruminate on some favourite spot, the young males and some females are detached two or three hundred yards each way to keep watch, especially if there be clumps of grass or bushes, behind which a man might lurk unseen, except for such a precaution. "It is folly," continues this well-informed sportsman, "to slip greyhounds after them, for, excepting by surprise, success is not to be expected, but, perhaps, at the expense of their lives." The height and distance of their bounds are wonderful, and said to be at least twelve feet from the ground, and over twenty-five or thirty feet of space, and as it were for their own amusement, appearing to deride such dogs as follow them. The chase, therefore, as an amusement (for the venison is dry and lean) is conducted by the Mahomedan and Hindoo princes, with hawks who fly at and fix their talons on the head and throat of the quarry, till the dogs can come up; or with the Cheetal, by surprise, as is also practiced in Persia*. They are found over the whole peninsula of India, to the northward and westward as far as the Indus; but as they do not resort to the sandy deserts, it is probable that they extend along the more fertile uplands of the Persian Gulph, particularly

* They are caught also, by means of slip knots attached to the horns of a decoy male, who, going up to the herd, is soon encountered in sport by the young males coming to play with him, and are entangled by the horns, and readily captured.

as we have been assured that our Indian travellers met them near Basora, on their way home over land.

As further illustrations respecting this interesting animal, we possess copies of two Indian paintings; the first representing a female of the highest Bramin cast, bearing the Been, a stringed instrument, on her shoulders, and inducing her tame antelope to follow, by holding out her beads; the second portrays an Indian and his wife, of the hill tribes, approaching an old antelope under cover of a shield of green leaves, the woman ringing a bell, while the man shoots it with an arrow: in both, the figures of the animal are spirited, and correctly drawn*.

Whether this species exists in Africa, is a question hitherto uncertain; we have shewn that the Lidmee of Shaw affords no decisive evidence, because he may have mistaken the horns of Addax for those of the true Antelope. Zoologists must not, however, expect to find this species on the deserts of northern Africa. The banks of the Nile, the Niger, and the cultivated tracts along the coast alone, could have been inhabited by them; and at present the western part of Morocco appears to maintain a breed. In support of this probability, we have in our possession the drawings of a male and female now in the Museum of Philadelphia, reported to have been brought from Mogadore, in that county. The pair are larger than the Indian variety, two feet seven inches at the shoulder, in their structure more robust; the horns of the male about eighteen inches long, in a straight line, very spiral, have at the base nine or ten close and small semi-annuli, reaching two inches high; above these are fourteen or fifteen complete rings, and the smooth end is short and strong. The pair diverges less than the Indian, are more bulky, though shorter, and of a

* Copied from a book highly ornamented and painted with Indian subjects, formerly presented by a native Prince to Warren Hastings, Esq., and brought home by him.

deep brown colour. From these characters it is evident that the specimen is old, yet the colours on the fur are not the same as in India, for they are rufous-brown, or deep tawny, without lateral streaks all over the animal, excepting the nose, mouth, space round the eyes, a spot on the throat, breast, belly, inside of the limbs, buttocks, and inferior part of the tail, which are white; there are small tufts on the knees, but none at the end of the tail; the female is without horns, with more white on the nose, no spot round the orbits, but one below them, and none on the throat, and the fulvous parts paler: this description agrees with the extracts quoted by Buffon from Marmol and Shaw.

Beside the above, we made a drawing of a third specimen in the Philadelphia Museum, which, we believe, was brought at the same time from Morocco, and was viewed by Mr. Peel as a species he could not refer to a known Antelope. It may, however, be presumed to be a younger specimen of the former. The height at the shoulder was less than the foregoing, the neck, body, and whole structure, more slender, and the head narrower; the horns about eight inches long, are almost straight, being only slightly wavy, seven or eight annuli mark three-fifths of the lower end, the rest is smooth and pointed, and the colour earthy brown; the lachrymary opening is scarcely perceptible; the whole head, back of the ears, neck, back, anterior part of the fore-legs, flanks, croup, thighs, and hind-legs, are pale tawny; the throat, breast, belly, inside of the limbs, anterior part of the thighs and buttocks, are white; a faint indication of a dark line separates the two colours on the flanks, and on the croup; the tail is short, dun above and white beneath, with a dark tip, but no tuft; the brushes on the knees scarce developed, and the hoofs low and black.

Of Antelope *Cervicapra* we have noted, compared, and sketched above thirty specimens, living, and in the stuffed

form, beside a multiplicity of horns and skulls; among the horns there are sometimes specimens perfectly smooth, and larger than those usually seen. Professor Lichtenstein, and others, have suspected them to belong to an unknown species; they are joined together with opposite points, to form a kind of cross worn in the girdle of some Mahomedan sectaries, who profess not to bear arms.

THE REDUNCINE GROUP.

The Antelopes of this group, distinguished principally by horns more or less bending forward, begin to recede from the elegance and fine proportions of the previous sections; they form a separate racemus, distinguished by the character of the horns, which are placed behind the orbits, but little reclined, mostly short, round, black, and annulated half way up, or less; their ears are long, open, oval, filled on the inside with white hairs; they have no externally developed suborbital sinus; the nostrils are ovine, or in a small muzzle; the fur on the hides, which are white or black, is larger, looser, undulating; the tails reach below the buttocks, and are thickly set along the edges and tip with long loose hair, but no tufts; their limbs are strong and lower in proportion than in true Antelopes, and their residence requires them to have more power in springing than fleetness, for they prefer open rocky mountains, or the cover of reeds and bushes along the banks, or the beds of desiccated upland rivers. The females are without horns, and provided with four mammae; they are not gregarious, but live in pairs, or small families of six or eight. The Kemas of Ælian would seem to refer to this group, or to be, as we shall find again in the next, intermediate; but that, and the chain to which we apply it, must ultimately be decided when the Bootan species shall be better known.

The *Rietbock*. (*A. Eleotragus*.) Mr. Allaman first described this species from the notes and a skin forwarded to

him by Colonel Gordon. It has since been further described by Professor Lichtenstein and Mr. Barrow, and Mr. Burchell brought the spoils of several with him from Africa. The Rietbock is full four feet six or eight inches long, two feet ten or eleven inches high at the shoulder, and more than three feet at the croup; the ears are above six inches long, and the tail between nine and ten; the horns are from ten to twelve inches long, recumbent beneath the plane of the face, divergent, regularly curved, with the points forwards, or rather upwards; they are black, wrinkled at base, and annulated with obscure and imperfect rings in the middle; the superior third smooth; the head is ten inches long; the eyes black; the suborbital pores not visible; the nostrils with small muzzle of black colour, but sometimes white; the colour of the fur is in general of an ashy-gray, tinged with ochre; the ears, lips, throat, breast, belly, anterior and internal side of the thighs and arms, white; the hair of the throat long and pendent; a blackish edge passes round the tip of the ears, and the tail is mixed with rufous and white at the end; the anterior and external side of the legs are ochery, and the rest white. This species is either monogamous, or resides in small families, among the reeds and bushes of dried river courses, and along the edges of springs, in the interior of Caffraria. We have compared five specimens. The females are smaller, and hornless, but resemble the male in colours and figure.

The *Nagor*. (*A. Redunca*.) This species is known only from Mr. Adanson's specimen and Count de Buffon's description; there are indications about it which create a suspicion that it is the young of the following or only a variety. It is described as above four feet long, two feet four inches and an half at the shoulder, and two feet eight inches at the croup; the horns are short, black, straight, with one or two rings almost smooth, and slightly

bent forwards ; no suborbital openings nor muzzle are mentioned in the description ; the fur is pale rufous all over, one and a half inch long, rather rough, and not close to the skin. The specimen was brought from the vicinity of Goree on the west coast of Africa.

The *Red Rheebok*. (*A. Fulvo Rufula*.) We consider this species as the adult of the former, notwithstanding the wide distance of the places from whence the two specimens have been produced. Allaman long ago noticed a species under the name of Rhoo de Rheebok, or Red Roebuck, not Rietbok ; and M. Afzelius justly viewed it as a species. Mr. Burchell in his arduous travels obtained a male, and M. Lalande a female of the species. If the Nagor be deemed to be the young, there is at least no doubt of the Lalandian being the female. We have drawn and compared both, and Mr. Daniell has likewise published a good figure of the male in his *Sketches of African Scenery, &c.*

The male in the British Museum is four feet eight inches long, two feet eight inches at the shoulder, and about the same at the croup. The head measures from the nose to the horns seven inches, and from the nose to the ears nine ; the horns, placed behind the orbits, are six inches long, close together at base, a little compressed, black, not much divergent, suberect, bent forwards with five obscure semi-annuli, separated by striæ in the front, reaching near half way of their length, the points smooth and rather approximating ; the ears are long, open, oval, edged at top with black, well lined with white hair both short and long. There is a small fold indicating a lachrymary sack, and the nostrils encompass a middle-sized black muzzle ; the face, throat, back of the ears, neck, and anterior part of the legs are tawny or clear fulvous, with a little whitish on the brows ; the chin is rather deep and strong, and with the lips, internal part of the arms, belly, anterior and internal face of the thighs, white ; the shoulders, back, an-

terior part of the upper arm, the flanks passing obliquely upwards towards the hips, croup and thighs, are fulvous-brown, with a cast of dull purple; the tail is six inches long, but the hair is loose, and furnished like a brush, making it nearly nine inches, the base dark, the middle fulvous below, and the tip white; the legs are strong, tawny, and a dark streak marks the anterior face of those of the male. On the back, croup, and sides, the hair is long, hard, loose, not very abundant, but feathering in whirls diversely turned, but most from the croup forwards; the skin and hoofs are black, as are the mammæ of the female, which are four in number. This sex is lower and longer, without horns, but strongly made.

The Red Rheebock inhabits the rocky mountains of Caffraria in small families of six or eight, seldom appearing on the plain; it springs with great force and audacity among rocks, but is not very swift, running with galloping action somewhat like a horse.

The *Cream-coloured Antelope*. (*A. Isabellina*). We suspect this species to be the Voalebock of the colonists, and a mere variety of colour of the former; it was established by M. Afzelius from a specimen in the collection of Thunberg. It is four feet ten inches long, two feet six inches at the shoulder, and two feet eight inches at the croup. The head from the nose to the horns is ten inches; the ears six inches and a half; the horns are eleven inches long measured upon the curve; their circumference at the base five inches four lines; distant one inch six lines at base; their basal direction at first parallel with the forehead, bending slightly upwards by degrees; they are black, round, shining, obliquely annulated, rough at base, six or seven in front, eight or nine in rear, because some of the superior are incomplete. The lachrymary sinus indistinct, only marked by a naked triangular spot situated before and beneath the eye; the incisors very short, the intermediate

largest ; the ears are long, straight, cylindrical at the base, dilated in the middle, almost pointed at the summit, white inside, and furnished with additional bristly hairs. A small space at their root covered with very fine hair ; the tail shaped like a brush, and straight ; the legs covered with close short hair ; no brushes on the knees. There are inguinal pores, and the hoofs are narrow and pointed ; brownish-black in colour. The hair is one inch and a half long, standing off the skin ; the interior brown, the longer and exterior gray, their intermixture producing on the back and flanks a general cream coloured or pale dun tone. The belly and end of the tail are white ; the forehead, top of the head, anterior face of the fore-legs and some other spots are yellowish ; the hair is feathery in several places on the back and behind the head. The specimen was brought from the Cape of Good Hope. If we except the omission of an obvious muzzle, the apparent superior length of the horns and head, and their basal direction, scarce a difference remains between this and the last species, but what results from a different tone of colour, which, however, might resemble more if the denominations of tints were alike with every describer of colours. It may be asked here if the female of this species or variety can have been mistaken by M. Vaillant for a kind of wild Equus, which he designates as an *Isabella Coloured Zebra*. As the gallop of the preceding species is said to resemble the action of a horse, the mistake may have occurred when the animal was seen at a distance.

The *Riet Rheebock*. (*A. Villosa*.) This species, known at the Cape by the name of Riet Rheebock, or Reed Roe-buck, and noticed by Lichtenstein under the name of *A. Capreolus*, forms the passage from this group towards the next. M. Desmarests describes the female, and we have long possessed drawings of both sexes from the collection of Mr. Burchell, in part, at the British Museum. In their

structure these animals assimilate most with the Reduncæ; for although the horns are nearly vertical on the head, the tips have a slight inclination forward; they have the muzzle of Fulvo Rufula, and the lachrymary sinus, though inwardly sufficiently large, is outwardly scarce visible; but the proportions of the animal have peculiarities not observable in other species; the neck is longer, the body less in circumference than any other Antelope, if we except the Chiru of Bootan; the hair also is soft, silky, and long, properties which it may derive from the scorched barren nature of the soil, which Providence has assigned it for a home.

The male is about four feet six inches long, two feet five inches at the shoulder, and two feet seven inches at the croup; the horns, placed above the eyes, are eight inches and a half long, straight, a little inclined forwards, nearly perpendicular to the plane of the face, black, round, slender, with thirteen rings reaching from the base half way up; distant at base one inch and a half, at the tips three inches and three-quarters; the head measures from the nose to the horns six inches and a half, and from the nose to the ears eight inches; the ears are six inches and a half long, open, pointed at the tips, white inside, with three dark striæ, and gray outside; there is a dark spot at the angle of the eye, beneath the orifice of the sinus; the eyes are large and black; the muzzle round, small, and black, terminating in a pointed nose; the lips and chin, white, with a black spot at the inferior angle of the mouth; the neck is long in proportion to the body, and the body very slender in girth; it is covered with rather long hair, feeling in texture like that of the Kangaroo, annulated gray and white, with a coat of yellowish, which becomes darker with age, on the specimens preserved in Museums, but is at first bluish ash colour; the breast and belly, and the inside of the arms and thighs, are white; the front of the legs are

brown, the posterior part ochery ; the tail almost five inches long, is gray, tipped with white, but has no real tuft at the end ; the legs are slender, rather long, and the hoofs small, pointed, and black ; round the eyes there is a dark circle, enclosed within one of a whitish colour ; the face is more mixed with ochre and brown, and the hair close and harder ; the chaffron dark-brown, and the throat almost white.

The females are smaller, without horns, but provided with four mammae and inguinal pores ; but the texture of the hair, and distribution of the colours, is nearly the same as in the males. We have compared three of them, and one male. The species has similar manners as the former, living in pairs, or small families, the males suffering no adults of their sex in company. When they are observed in greater numbers, it is occasioned by the attraction of water, a rare element in South Africa, but most particularly in the barren districts of the west coast, where they mostly reside. The females bear but one kid at a time, which is at first almost fawn-coloured. It is an animal of great swiftness, moving with wonderful rapidity by lengthened stretches, close to the ground, so as to seem to glide over the desert like a mist driven by the winds, and, favoured by the indistinct colours of the fur, is immediately out of sight. The Bushmen, and western tribes make lance heads, awls, and other tools, of the horns, and, occasionally, cloaks of their skins for the women*.

* On this and many others of the Cape Animal, I owe much of my information to the late Colonel Graham, who, as Colonel of the Cape Corps, commander of the interior, and a keen and indefatigable sportsman, had collected numerous facts on the local natural history of the Colony, which it was his duty often to traverse in various directions, where he was settled, and fated to die, in the full vigour of life. I would fain say more of one whom I respected as a private gentleman, and admired as a soldier, in the tumultuous scenes of war.

The *Orebi*. (*A. Scoparia*.) The last which we place in this group is the *Orebi*, one of those anomalous species which retains a Reduncine character in the horns, and the four mammae in the females, but departs from them by having the suborbital sinus developed, as in the next, and, besides, resumes a character belonging to true antelopes in the brushes on the knees. The adult male is about four feet in length from nose to tail, and is equal in stature to the Roebuck, or twenty-two and twenty-four inches in height. The head is five inches long from the nose to the horns, and eight inches from the nose to the ears; the horns are nearly vertical, slightly bent forwards, black, round, five inches long, with six or seven wrinkles at base, and then five annuli reaching half way up, the rest smooth and pointed; they stand close above the orbits, one inch and a half asunder at base, and three inches and a half at the tips; the head is round, with a prolonged snout; the chaffron rather convex, and the nose terminated by a small muzzle: under the inner canthus of the eye is a well defined lachrymary opening; the incisors are small, overlapping, the external edges being oblique and prolonged; the ears are long, rather pointed, white, and villous inside; the neck slender, and the knees tufted in both sexes: compared with the length of the animal, the legs are high; the face and back are tawny in some, and paler-fulvous in others, this colour extending over the back of the ears, shoulders, flanks, anterior and external side of the fore-legs, down the croup, thighs, and hind-legs; above the eye there is in most specimens an arched white streak, and that colour surrounds the mouth and nostrils, passes along the under jaw, the breast, belly, and inside of the thighs; on the throat and breast the white hair is long, soft, and pendent; the tail is short, hairy, and blackish; the skin is black and naked in the groin of the pale coloured specimens, and the mammae, four in number, are likewise black, but

in the fawny or bright rufous it is white, and the teats are rose-coloured; the females are without horns, and in other respects resemble the males.

Of this species we have compared seven specimens, among which three were females, and one a young male, whose horns were still more erect than in the adult, the annuli very small, and the edge of the buttocks white. The Orebi resides in pairs or small families in the interior of Caffraria, and from the difference of colour in the hide and in the fur, we would infer that it frequents both the woody cover and the open plain.

THE OREOTRAGINE GROUP.

In this section which embraces at present but one species, the characters present a sudden passage from the surrounding racemi to the Caprine forms and manners; the horns are short, slender, vertical, and parallel, with very few annuli; the suborbital sinus is conspicuous, and marked with a dark spot, but the head is short, the superior edge of the orbits projecting; the body and legs, when compared with the size, exceedingly robust; the hair is of a singular structure, being hard, flat, spiral, flexible, and erect upon the skin, with the tips turned back, or reclining; the females are hornless, but in other respects resemble the male; they have inguinal pores, and two mammaræ?; their *habitat* is confined to barren precipitous rocks.

The *Klipspringer*. (*A. Oreotragus*.) The form of this animal is very like that of the Ibex Kid, of about seven months old. The male is about three feet seven inches long, and twenty-one or twenty-two inches high at the shoulder and croup; the head is short, broad, and round, tapering rather suddenly to a small mouth, terminated by a diminutive muzzle, of a black colour, the dark part ascending in a point upon the ridge of the nose or chaffron; the incisors are equal, touching at the edges, and the mid-

dilemost close together; the ears are middle-sized, broad, and pointed, reaching as high as the horns; they are white within, and whitish ash-colour outside; the horns are about five inches long, distant, round, vertical, slightly bent forwards, obscurely wrinkled at the roots, and annulated below the inferior third, the rest smooth, pointed, and black; the eyes, covered by the arch of the orbits, are full, dark, hazle, and lively; they are edged with black, and beneath them is a suborbital opening, marked by a black spot; the body is round and compact, and the tail almost rudimental; the legs nearly as robust as in the Goat, the joints broad, the arms long, the cannon bones or shanks short, the pastern joints high and rigid; the hoofs short, rounded, hard, and black; there are no brushes on the knees, and the spurious hoofs are close and flat; the hair, of equal length all over the neck, body, and thighs, is squill-like, dry, and spiral, standing off the skin, and forming a natural pad, to protect the body from bruises, the points alone lying flat. It is ashy at the root, brown in the middle, and yellow at the point, producing the singular effect of a lively olive-green; the legs below the joints are buff.

None of the species in this genus have so completely the lively gamboling manners of the young goat as the Klipspringer; none bound with greater force and precision from rock to rock, gathering their feet upon points or rugosities among the cliffs, apparently too small to admit of foothold. The least obliquity or ruggedness of surface suffices them to run up and hold their footing. The solidity of their pastures is such, that on the plain, at their highest speed, no other marks are perceptible of their track, than the points of the toes, all other ruminants in similar cases always imprinting the spurious hoofs also. With powers like these, a certain sense of security against carnivorous animals is created, which exposes them to be shot by sportsmen, while, as it were, deriding the vain

efforts of his dogs. They were formerly so abundant in the colony of the Cape, that their elastic hair was used to stuff saddles ; but now they are become rare, excepting in the interior. The females resemble the males in every respect excepting in the absence of horns ; they live in pairs among the most precipitous rocks of South Africa, where they are, nevertheless, eagerly sought on account of their venison which is considered among the best in the country.

We have compared two males and three females, several skulls and fragments of their spoils.

THE TRAGULINE GROUP.

Messrs Forster and Lichtenstein have considered the present *racemus* as consisting of varieties of colour only, the animals being all of the same species : it must be confessed that their characters and colours, passing from one into the other, afford grounds for the suspicion and would lead to a conclusion that difference of age and of residence are sufficient to account for the trivial distinctions observed between them. The Cape colonists, however, are of a different opinion, and Mr. Burchell appears to coincide with them principally, because—with the differences of colour observed among them—they vary in manners, habitat and stature. As this is a question which cannot be decided in the present state of our information, nor indeed of very great importance, we shall describe them as separate species by the names which they have received from the above learned zoologists and travellers.

The group consists of animals small in stature, high upon the legs in proportion to their length, slender in form, and like the preceding, destitute or nearly destitute of tail ; the ears are longer than the horns, rather broad and not much pointed ; the horns are short, distant, round, vertical, parallel, inclining slightly forwards or backwards, with

no, or only slight, indications of wrinkles at the base. The skin round the orbits black, having a suborbital sinus, and small black muzzle; the females without horns, with two mammæ and inguinal pores.

The Steenbock. (A. Rupestris.) Professor Lichtenstein appears not to have known the adult of either of the Steenbocks, and particularly the present, which is larger and more robust in structure than his *Tragulus*. It is nearly equal in size to *A. Scoparia*, three feet six inches long, about twenty inches high at the shoulder, and twenty-one or twenty-two inches at croup; the head is oval, with the snout pointed, and terminated by a small round and black muzzle, ascending in a point on the ridge of the nose; the horns are vertical, or at a right angle with the plane of the face, distant, straight, parallel, round, pointed, and black, with only one or two rudiments of wrinkles at base, not quite four inches long, and seated nearly between the orbits; the ears longer than the horns, are open, pointed, with three dark naked striæ between, scanty white hairs within, and pale fawn-coloured outside, edged with black; the eyes are placed high in the head, with black eye-lashes, and a small black suborbital sinus placed beneath their inner canthus; the forehead and nose are pale chocolate rufous; sides of the face, mouth, and chin, fawn-coloured; the back of the neck, shoulders, back, and croup, rufous chocolate, passing into rufous on the sides of the neck, flanks, and thighs; the breast, belly, anterior part of the thighs, buttocks, and inside of the limbs, are white; the legs entirely dun, or dark buff; the groin is naked and black; there is a small collosity on the knees, and the tail does not protrude beyond the hair; the hoofs are rather high, short, and black, and the pasterns short. In this species the incisors are narrow, long, oblique, overlapping, and the two middlemost close.

The Steenbock is still found within the limits of the



*C. Hamilton Smith. Eng. 1867.
J. Van der Meulen.*

VLACHTE STEENBOCK.

A. RUFESCENS.

Colony of the Cape of Good Hope, but is very rare, residing entirely among the rocky cliffs of the eastern districts, and evincing great vigilance and activity. The specimens we have seen came from Algoa Bay. In the Dutch language the name *Steenbock* properly signifies the Ibex, and can have been bestowed upon the species only on account of a similarity of manners between the two animals.

The *Vlackte Steenbock*. (*A. Rufescens*.) We are indebted to Mr. Burchell for a knowledge of the male of this species, which might be considered as the young of the former, but that its residence is on the plains, as the colonial name *Vlackte*, plain or open country, implies; and that the brilliant colouring of the fur is not a sign of nonage. The horns are subvertical, reclining a little at base, with the tips slightly bent, so as to point upwards; they are round, black, parallel, sharp, perfectly smooth, or without any wrinkles or striæ, three inches and a half long, one inch and a half asunder at base, two inches at the tips: the ears are longer than in the preceding, measuring four inches and a half, and reaching beyond the points of the horns, rather rounded at the tips, lined on the edges and inside with white hair, streaked with dark lines inside, and gray outside; the head is somewhat squarer, tapering gradually to the nose, and not as in the former contracting suddenly before the orbits: between the nostrils there is a small black muzzle; the head, neck, back, flanks, upper arms, and thighs, are bright fulvous-red, with something of a cast of crimson; a spot along the lower eyelids, and passing beneath the lachrymary sinus, is white, as is also the under jaw, throat, breast, internal face of the fore-legs, belly, interior of the thighs to the edge of the buttocks, and after part of the hind-legs and pasterns; the rest of the legs from the joint downwards are pale rufous: no tail is visible beyond the hair of the buttocks.

Of this species we saw the drawing of a female taken at

the Cape by the accurate Le Sueur, and found the male in Mr. Burchell's magnificent donation to the British Museum. The animal stands high on the legs for its length, which is only two feet six inches from the nose to the rudiment of tail. Of all the smaller antelopes, this appears the most elegant in the delicacy of its limbs, and brilliancy of colour. The Vlackte Steenbock resides in pairs on the open plains, along the borders, and beyond the limits of the Cape Colony, and is very rare.

The Grysbock. (A. Grisea.) This species was first noticed by Mr. Forster, and figured in the Banksian collection. It is larger than the last, being nearly three feet long, nineteen inches at the shoulder, and about twenty at the croup; the head is oval, and shorter than the former, four inches and a half from the nose to the horns, and six inches from the nose to the ears; the horns are nearly four inches long, round, black, smooth, vertical, sharp, slightly inclining forwards, one inch and a quarter asunder at base, three inches at the tips; the muzzle is small and black; a space round the eyes, and the prolongation of the inner canthus forming the lachrymary slit, are black; the ears, four inches and a quarter long, are wide and open, marked on the inside with three dark streaks, and rufous on the outside; round the nose there is a little whitish; the rest of the head, neck, body, and thighs, is deep chestnut-red, intermixed or stippled with single white hairs; the throat, breast, belly, and inside of the limbs and legs, are rufous; the tail protrudes little beyond the hair; the hoofs are small, black, and pointed; the pasterns short, and the cannon bones, or shanks, long and slender.

The Grysbock was described by Professor Lichtenstein under the name of *A. Melanotis*. It inhabits the mountains overgrown with shrubs, and is swift and vigilant. At present few remain within the limits of the Cape Colony. We have compared four specimens, two male and two

female, who, excepting that the latter is deprived of horns, are perfectly alike. Its local name of Grysbock signifies Gray Goat.

The *Bleekbock*. (*A. Palida*.) Among the Cape Colonists mention is often made of the Bleekbock, or Pale Goat, but the animal is rare. Professor Lichtenstein considered it as a mere variety, but it does not appear that a specimen actually came under his eyes, because he insinuates that it is the female, whereas the female is without horns; nor is it less in size, we having compared three specimens, all higher on the legs than the Klipspringer. It is about equal in stature to the Steenbock, but much more slender, and delicately formed: the head is rather square about the forehead, the horns perfectly straight, incline slightly backwards; they are round, black, smooth, and very pointed, with an obscure line running down the front; the muzzle is small and black, passing in a point upon the nose; the eyes, with a very small lachrymary opening, have a black edge round them; the ears are somewhat shorter and broader than the former, more villous within, and marked with two dark perpendicular streaks on their inner surface, and grayish on the outside; the forehead, neck, back, shoulders, posterior part of the upper arm, flanks, thighs, and buttocks, are of a pale rufous fawn colour; the lips, chin, and arch over the eyes, a spot on the throat, the breast, anterior part of the arm, belly, anterior and internal face of the thighs, white; the legs from the joints downwards pale buff; the tail, near three inches long, is buff; the pasterns are long; the hoofs very low, small, and black; the groin is naked, and the skin black; the females are somewhat more red in colour, without horns, but in other respects the same, shewing two black mammæ.

The Bleekbock inhabits the plains, is solitary, or only accompanied by one female; they conceal themselves in the bushes, are excessively shy and swift, and owing to the in-

distinct colour of their fur, easily escape the eyes of sportsmen : they seem to be confined to the eastern side of South Africa, and are nowhere numerous.

THE RAPHCERINE GROUP.

This group might be united with the former, if the characters of the horns were alone to be considered, for they are destitute of every vestige of wrinkles or striæ, perfectly round, smooth, and very sharp, but not parallel. Their position on the frontals is subvertical, the forehead is very narrow, indicating animals of a diminutive size, whose residence, besides, being confined to the East Indies or the islands of the Indian Archipelago, makes it probable that when we shall be acquainted with the whole of their characters, distinctions will be observed which will confirm their separation. At present the horns attached to a part of the frontals is all that is known of them ; but these tend to shew that Mr. Johnson alludes to them under the name of *Small Deer* in his *Sketches of Field Sports, &c.* ; assigning them a residence in the Rhamghur district, " Where the *Deer* with four horns, or *Chickara*, are likewise found," and describing them as not larger than an English hare, with long ears, exceedingly active, and delicately formed.

The *Sharp-horned Antelope*. (*A. Acuticornis*.) M. de Blainville first described the horns of this species from the fragment of a skull in the Royal College of Surgeons of London ; they are only three inches long, perfectly round, smooth, black, and pointed, about three-eighths of an inch in diameter at base, slightly bent outwards, and diverging ; the frontal crests, passing behind them, unites with a broad parietal bone, with the sinciput much elevated, narrow, and somewhat square ; on the parietal are many rugosities, perhaps from disease. The fragment belonged to a young animal, and was brought from India ; and upon comparison with the *Chickara* of the next group, we have some doubt

whether the *Acuticornis* be not the same species, with the spurious horns and anterior part of the frontals wanting, but this, nevertheless, much smaller.

The *Awl-horned Antelope*. (*A. Subulata*.) The horns of this unquestionable species, attached to the frontals, are likewise in the Royal College of Surgeons; they are not above three-eighths of an inch in diameter, subvertical, round, smooth, black, four inches and a half long, bending outwards in the middle, and the points again a little inwards, one inch and two lines asunder at base, two inches distant about the middle, and something less at the points; they stand higher on the frontals than the preceding, the sinciput is broader, round, and placed on a narrower parietal. The specimen was likewise brought from the East.

THE TETRACERINE GROUP.

There are few or no examples of animals in a state of nature, beside the present, who have four horns as a permanent character. The *Colus*, indeed, is reported to be found sometimes with three, and several breeds of sheep have four, five, or six horns, but these are invariably monstrous productions, issuing from nearly the same base, and constituting a morbid superabundance of that organic substance. In the *Tetraceri*, however, these productions are constant and uniform, the upper or true pair rising on the frontal crest, and the lower, or spurious, as invariably between the orbits. Skulls of these animals have been preserved for years in the Museum of the Royal College of Surgeons, and in the superb collection of Mr. Brooks. From the former M. de Blainville published an account of a species; but we are indebted to the investigations of General Hardwicke for a complete description of the animal. For although M. F. Cuvier produced a figure, his notice communicated by the late M. Davaucel, is not sufficiently

explicit, and possibly not altogether correct. We are, however, inclined to believe that there are two species of *Tetraceri*, differing in the characters of the horns, and in some other trifling particulars, as shall be noticed in the sequel. The name of the group is derived from the generic denomination which Dr. Leach first bestowed upon the Four-horned Antelopes.

The *Chickara*. (*A. Chickara*.) We cannot give a more satisfactory description of this animal than by repeating the excellent account furnished by General Hardwicke, in the *Linnean Transactions*, Vol. xiv. "This species of Antelope," he says, "seems hitherto to have escaped any particular description of the naturalist; and this circumstance is the more remarkable, as the animal is not scarce in India. It inhabits the forests and hilly tracts along the western provinces of Bengal, Bahar, and Orissa, and is known by the name of Chickara. It is an extremely wild and agile creature, and only to be tamed when taken young. In size this species is something less than the Harnessed Antelope (*A. Scripta*); it is in height, from the foot to the top of the shoulder, twenty inches and a half; and in length, from the nose to the root of the tail, thirty-three inches, or two feet nine inches; and the tail is five inches more. The superior, or common horns, are black, subulate, rounded, without annulations, smooth, and erect, slightly inclined forward, and a little diverging; their length three inches; space between them at the base one inch eight-tenths; the greatest thickness at the base is two inches in circumference, and gradually tapering to a point one-tenth of an inch in diameter. In front of the common horns (one inch four-tenths), in the middle of the forehead, and between the eyes, rises a very short pair of spurious horns, erect, stumpy, smooth, cylindrical, three-quarters of an inch in length, one inch and a half in circumference at base, and suddenly tapering to a point; they are apart at

base three-quarters of an inch, and at their tips one inch two-tenths. Head in length seven inches and a half, and its greatest circumference across the cheeks and behind the spurious horns thirteen inches; ears mostly erect, ovate; the greatest breadth about two inches and a quarter, and length four inches and three-quarters; nose naked and black; the margin of the lips black; eyes large, with strong bristly black eyelashes; limbs delicately made, the shanks of the fore-legs being two inches and a half in circumference, and those of the hind three inches; the proper and spurious hoofs are black; the greatest circumference of the body is twenty-nine inches. The general colour of the animal is an uniform and bright bay on all the upper parts, and below, *i. e.*, the chin, the under line of the neck, the abdomen, the inner side of the thighs, and under the tail, inclining to white, more or less mixed with sandy hairs; the teeth in the lower jaw are eight in front, the two middle ones being much larger than the six lateral teeth, and spread out; their inner margins rounded and not touching, and their internal surface hollowed out like a spoon; in the hinder part of the jaw, on each side, are six grinders, with pointed surfaces, and a like number in the upper jaw, similarly constructed.

“The female differs only in having no horns, and being of lighter colour. This distinction of colours is found to be a permanent character; it at least remained so for the four years I kept a pair in my possession, and within which period they bred; two young ones were produced at the same birth, one male, and the other female; and the distinction of colour, as above, was conspicuous at that early stage, and continued. The male in the rutting season becomes exceedingly wild and mischievous, and, although partly domesticated, continues dangerously so, running at every animal within its reach, whether deer, goat, or man; even the feeder could only approach him on the verge of the

circle to which the rope he was tied with allowed him to reach."

In this statement the General has not marked the time of gestation, nor the period of the rutting season; and we regret the omission of the number of mammaræ in the female, as they are at least a secondary character for the distinction of groups.

The Four-horned Antelope. (A. Quadricornis.) It is a question whether the skull in the Royal College of Surgeons be of the Chickara or not: the length, position of the upper horns, and their direction, are similar, but the spurious horns are subtrigonal, and of a yellowish colour on their internal face, possessed of three wrinkles or small annuli at the anterior base, robust, vertical, and one inch and two-thirds long. The head is narrower than the former; the frontals are prolonged above one inch before them, having on each side a wide open space, and the nasal bones begin consequently lower down. In front of the spurious horns are several rugosities; the parietal is broad, and surmounted by an elevated crest of the sinciput; the superior arch of the orbits is also more straight than usual, and more prolonged over the eyes. In this specimen the osseous cores of the superior horns alone remain two inches and three-quarters long, but no comparison can be made of the horny sheaths themselves; the skull is something above seven inches in length*. There is a second skull in the Museum of Mr. Brooks, from which, we believe, Dr. Leach drew the characters of his *Tetracerus Striaticornis*. It is, perhaps, worth remarking, that in this racemus the interorbital horns appear to be composed in the greater part of corneous matter, with only a short bony nucleus within.

* M. de Blainville, mistaking the meaning of the ticket attached to the head, says, it is named Hoornadabad in India, whereas the specimen is stated to have been brought from Moorshadabad.



THE FOUR - HORNED ANTELOPE.

A QUADRICORNIS.

Published by G. B. Williams, Dec. 1876.

In the paper before noticed, General Hardwicke expresses a doubt that the head here described is not of the same species with the Chickara, and we are inclined to the same opinion, especially since the drawing of a four-horned antelope was published by M. F. Cuvier, communicated to him by the late M. Duvaucel, who, it appears, represents the species as belonging to Nepaul. In this figure, of which we were enabled to make a copy through the kindness of M. Cuvier, the superior horns are slightly annulated, whereas in the Chickara they are perfectly smooth; the animal is also more elevated on the legs, and the colour of the back is brownish; the ears are larger, with three faint streaks within them; the spurious horns stand before the middle of the line between the orbits, and not behind that line, as in the Chickara, and the suborbital sinus terminates in a round opening, and not in a slit like the other; the under jaw is white, and the tail longer. It may, therefore, be presumed, that the Duvaucelian figure represents the *Quadricornis*, in which the more advanced position of the spurious horns is very evident; nor can we assent to the conclusions in the note at the end of General Hardwicke's communication to the Linnæan Society, that the figure in question is copied from his specimen, because we have been allowed by M. F. Cuvier to copy several other drawings of ruminants, forwarded by that gentleman from India, some of which will be noticed in the sequel, including specimens from Nepaul. We think these observations due to the memory of M. Duvaucel, whose zeal in pursuit of natural history has led to a premature death*.

* Dr. Leach has favoured us with a note respecting his *Tetracerus Striaticornis*, in which he expressly states, "Horns longitudinally striated, transversely striolated, with rings at their basea." This character appears to agree with M. Duvaucel's Chickara, or our *Quadricornis*, and supplies the characters deficient in the skull above noticed.

THE CEPHALOPHINE GROUP.

We place, among others, in this group, the animals which have been noticed by authors under the name of *Grimmea*, varying very considerably in stature, but all distinguishable by a tuft of hair rising from the forehead, and more or less spread between the horns; by a pouch or sack opening between the orbits and the nostrils, in some forming a black slit in the shape of a segment of a circle ending near the nostrils, in others by a puncture near the corner of the mouth, and seemingly appropriated to a different purpose in the animal economy, than the usual lachrymary sinus. The horns of all are small, straight, or nearly so, reclining placed high on the forehead, black, with wrinkles or annuli: the muzzle is rather developed and black, and several have the forehead entirely covered with long fulvous hair, parting to the right and left from the centre. With the exception of one, they want no brushes, the pasterns are short, and mostly of a dark colour, passing in a streak upwards to beyond the knees; the tail is short and tufted with long black hairs; the females are without horns, and have two or four mammae. The group extends over South Africa, from Senegal to the Cape of Good Hope. It is probable that the whole is possessed of nearly similar manners; residing in bushes and low covers, standing up on the hind-legs to look out for danger, even leaping into the air to overlook obstructing vegetation, and then running into concealment from one bush to another. These manners, and the strong family resemblance maintained through them all, account for the difference of stature assigned to species under the same name, and the vain endeavours to make them agree.

*The Bush Antelope. (A. Silvicultrix *.)* This species is

* *Silvicultrix* appears to be a wrong translation of *Bush Goat*. The Swedish Zoologist has no doubt mistaken the meaning of *bush*, and considered it synonymous with *forest*; Desmarests justly applies the term *Buisson*.



Illustrated by
 C. H. Sprockman and H. H. Sprockman

BUSH ANTELOPE.

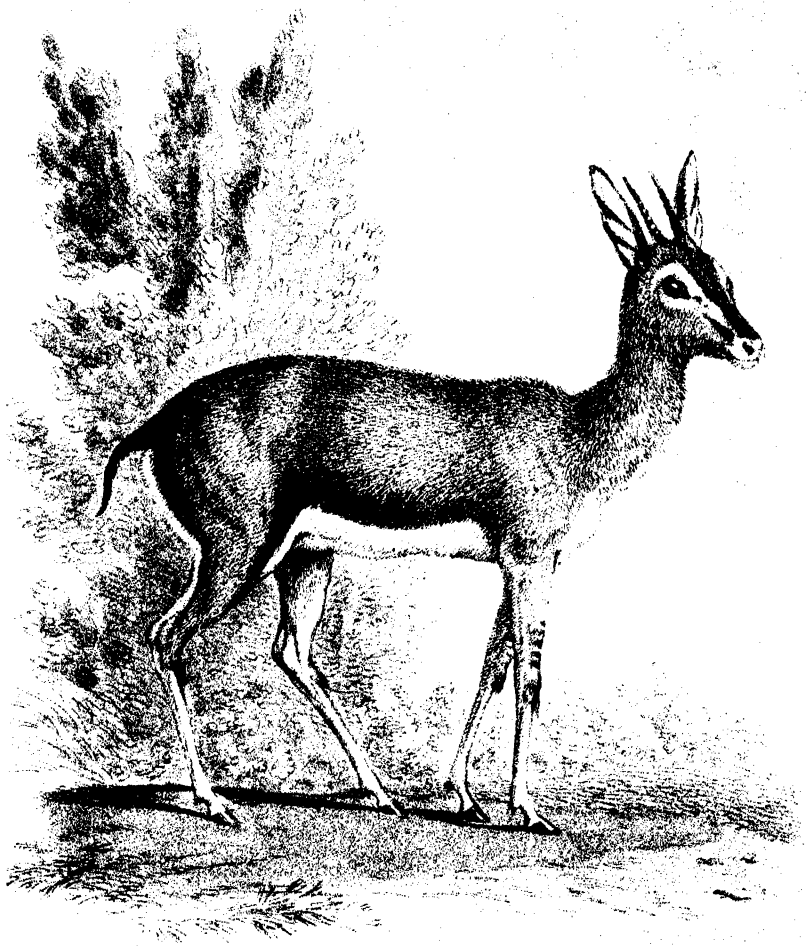
A. SILVICULTRIX. Young Male ?

known to the British residents at Sierra Leone by the name of Bush Goat ; it is of considerable stature, and if really belonging to the present group, the largest of the whole. The length from nose to tail is five feet ; height at the shoulders less than three, and at the croup three feet two inches ; the head is ten inches long, and both the horns and ears four, and the tail six ; the head, as in others of the group, is oval, the snout pointed ; the horns, reclined on the prolongation of the plane of the face, are short, very straight, pointed, closely wrinkled for about six lines, then marked with inequalities for the space of an inch more ; the points diverge outwards ; the ears, situate near the root of the horns, are about the same length, rounded at tip, and the eyes are furnished with heavy eyelashes ; the tail hanging and bush-like ; the anus naked ; the legs are slender without tufts ; the mammæ two ; the fur generally soft, recumbent and shining, principally of a dark brown colour, paler on the neck and flanks, grayish on the thighs and buttocks, almost yellow on the throat, and Isabella colour along the spine, widening over the loins, where the hair lengthens to two inches ; hair of the head short and close ; anterior part of the cheeks, sides of the nose and chin, of a dirty yellowish-white ; chaffron and forehead of a clear brown, surmounted by a tuft of hairs one inch and a half long, covering the root of the horns ; the external side of the ears brown, the internal grayish ; the tail dark ; the legs chestnut brown.

This species inhabits the bushy acclivities of the open mountains of Sierra Leone, and the vicinity of the Upper Quia and Pongas rivers. It quits the cover about sun-rise to feed, and is then shot by sportsmen. It is not so fleet as other Antelopes, and its venison is esteemed. From the above account, extracted from the *Acta Upsal.* by M. Afzelius, this animal is nearly allied to the next, perhaps they form only varieties of the same species.

The *Broad-eared Antelope*. (*A. Platous* *.) There exist in the Museum of the Missionary Society of London, the spoils of an antelope belonging to this group, brought from the Cape, under the wrong name of Steenbock. The specimen is enclosed in a case, and in a recumbent attitude, and when the sketch and notes were taken, it was placed in an unfavourable light ; some inaccuracy may, therefore, exist in the description. It is estimated to be in length equal to the preceding, with a very pointed snout and diminutive muzzle. The horns are sub-erect, not five inches long, black, straight, divergent, round, and very sharp at the tips, somewhat irregularly annulated to three-fourths of their length ; the ears are very wide, pointed, longer than the horns, whitish within, and dun-coloured on the outside ; the eyes are large, edged with black eyelashes, and beneath them, more on the cheek than usual, is a black spot, marking the suborbital opening. From the vicinity of the nostrils the chaffron is dark sepia, spreading wider at the commencement of the forehead, from whence the hair is more lengthened and bristly, of a bright brown, and turned upwards, so as to cover the base of the horns. Round the nose and mouth, the fur is close and fine, of a yellowish white and fawn colour on the cheeks, round the eyes and temples. The back of the neck is brown, becoming paler as it approaches the throat, by a mixture of fawn colour, and the throat itself is almost white ; the shoulders and back are of the same mixture of brown, fulvous, and fawn colours, but we observed no lengthened hair on the croup, as in the former ; the belly and inside of the limbs are gray ; the legs fine and firm, yellowish-brown in colour, without tufts, and the hoofs small, pointed, and black ; the tail is of the colour of the back, not bushy, and appears full six inches long, but without a terminal tuft. The spe-

* *Platous, latus, ōvis, auris.*



FOUR-TOOTHED ANTelope.

AQUALANA COPA Ham. Smith.

cimen seemed long in the body, and the fore-legs may be some inches lower than the hind, of which the shanks are evidently long.

By the denomination of Steenbock, though it be applied to the wrong species, we may infer that the animal resides on rocky mountains in the interior of Caffraria, but its habits are unknown. If it be the same as *Silvicultrix*, the species must extend from Senegal to the banks of the Gareep. The figure was designated, in the original series of drawings in our possession, by the name of *Platous*, before the description of *Silvicultrix* was published, and we have thence preferred retaining them separately, because there appear no proofs that the species of the Cape Colonies and *Nigritia* are the same, excepting when they both reside on the east coast of Africa, and our specimen was understood to have come from the vicinity of the Gareep. There is, besides, a doubt that *Silvicultrix* is described from a female, in which case that species cannot belong to the present group, but must be referred to another not at present determinable.

Four-tufted Antelope. (A. Quadriscopa.) We saw this singular and hitherto undescribed species in a living state at Exeter 'Change, where it was kept for some time and then sold, but being excessively shy, we understood that it met with an accident in removing, and probably perished. Thus much it is necessary to premise, in order to explain why a more accurate description could not be obtained. It was less elevated on the legs than a roebuck, but about equally long in the body; the head round with a tapering nose and muzzle; the horns about four inches long, situate rather high on the head, nearly straight, divergent, slightly bent back, round, black, sharp at the tips, with about six or seven small annuli at base; the ears rather wide, longer than the horns, marked with two black stræ within; the neck long, the body rather bulky, and the legs very elegant;

the forehead was covered with longish hair of a mixed buff and sepia-gray, darker down the nose ; the back of the ears similarly coloured ; from their root, passing round the eyes to the mouth, the colour was buff. A small lachrymary opening appeared under the eye, and between that and the nose a narrow dark streak, apparently not open but naked. The cheeks, neck, back, flanks, and thighs, were of a similar buff and sepia-gray, paler on the flank, and towards the belly and buttock edged with an indistinct darker band ; the lips, breast, belly, inside of the limbs, buttocks, and houghs, were white ; the external and anterior face of the arms and hind-legs dirty buff, marked above the knees with four narrow and dark cross streaks, similar to those usually seen on the legs of mules ; but the most remarkable character was, that brushes or tufts of hair of a dark colour marked each leg below the knees of the anterior, and on the upper anterior face of the posterior ; the pasterns were short, and the hoofs small, black, and pointed. The individual was brought from Senegal.

Burchell's Antelope. (*A. Burchellii*.) In the Cephalophine group, the Duiker or Dodging Antelope appears to form not a species alone, but a small racemulus, being surrounded by others so nearly allied, that they may be regarded as varieties, although we believe it most advisable to describe them separately, leaving the question of identity to future investigation. At the head of these, appears a specimen shot by Mr. Burchell's hunters, who, as we were informed, considered it as new to them, nor did a second come under his observation. The spoils of the animal are now in the British Museum, and although the characters in general would refer them to a *A. Mergens*, yet when compared with several specimens of that species, procured by the same indefatigable naturalist, the differences are sufficiently obvious. The total length, from the nose to the rump, is three feet five inches ; from the nose to the horns

seven inches ; length of the horns, five inches ; of the ears, six inches ; total length of the fore-leg, one foot three inches ; length of the posterior cannon bone, or from the toe to the hough, one foot. The structure of the animal, and particularly of the limbs, is remarkably solid ; the horns placed high on the head, little elevated from the plane of the nose, much approximated, parallel, the superior third alone slightly bent outward, and then again inward and forward ; they are black, round, and obtuse at the point, shew at base a succession of six or seven very irregular coarse wrinkles, then a striated space, surmounted by a second series of irregular wrinkles, striae and obsolete annuli, not easily described with clearness. There is no external opening of a lachrymary sinus, and the suborbital pouch is scarce perceptible ; the ears are wide, long, and open, marked with three grayish streaks within ; round the base of the horns, the hair is long, lying outwards, and upon them of a bright fulvous colour ; the forehead is dun, and the chaffron black down to the muzzle, which is small and round ; round the eyes, cheeks, sides of the nose, and back of the ears, the colour is reddish-buff gray ; the neck, back, flanks, croup and buttocks, are covered with rather coarse loose hair of a brownish rusty dun colour, producing a dark Isabella teint ; the throat, belly, and inside of the limbs, more ashy ; the tail is short, twisted, lined with coarse hair, above black, beneath white ; the legs dark buff, with a blackish streak down their front, from the shoulder to the fetlock, from whence it spreads, and renders the pastern wholly black ; the hind-legs have a similar line along the shanks, and upon the anterior part of the pasterns ; these are very short and strong, and the hoofs rather high pointed and black.

We propose to distinguish, provisionally, this species by the name of the traveller, to whose arduous enterprise we are indebted for this and many other subjects of the

ruminating order. It was, we believe, obtained in the interior of the west side of Caffraria.

The Duker Bock. (*A. Mergens.*) There is a particular distinguishing character about the horns of this species, which separate it unequivocally from all other Antelopes. It consists in a ridge more or less obsolete, rising on the anterior surface, and passing through the four or five annuli of the middle, but not through the closer wrinkles at the base. The horns do not exceed four inches in length, somewhat more distant at their root than in the preceding, diverging slightly, bending outwards and more reclining along the plane of the face, black, and obtusely pointed; the total length of the animal is from three feet two inches to three feet six inches, and the height about twenty-one inches at the shoulder, and twenty-three on the croup, or something more; the forehead is entirely covered with long coarse hair, reaching above the base of the horns, of a fulvous colour, which passes also over the back of the ears: these are five inches long with three dark streaks on their inner surface; the chaffron has the same black streak down to the muzzle, and the legs similar dark markings, and somewhat the same robust structure as the former, but on the side of the nose a dark naked slit is very perceptible; the fur is of a light brown colour, close and smooth, and the throat, breast, belly, inside of the limbs, and under part of the tail, are partially white. In the female the white extends along the back of the legs, and the dark colours on the front are wanting. Among the different specimens examined, the fulvous hair of the forehead was sometimes tarnished, and the annuli of the horns scarce perceptible, but the basal wrinkles and the anterior ridge always prominent. The frontal ornament is then often in the shape of a single tuft placed between the ears, especially in the females, and the whitish parts ashy. These may be signs of youth, for in an old male the colour of the



C. Janssen pinx.

A. Janssen sculp.

ANTILOPE SUTUROSA *ott.*

fur resembled the Burchellian, but the characters of the horns were decidedly of the present species.

This species is easily tamed to a certain degree, but always timid, becoming alarmed at the least unusual noise, and concealing itself on hearing thunder. It resides in bushy plains, alone, or in pairs, rising upon the hind-legs to look round, making a blowing noise with the nostrils, and then stooping and flying under the cover of the vegetation to stand and rise up again : we have compared eleven specimens.

Dodger Antelope. (A. Ptoox.) The name of Duiker in the Dutch language, is derived from *Duiken*, to dodge, to stoop, not to dive ; it has been applied at the Cape to the former animal, and transferred by zoologists to the present, and even to the next or the true Grimm. The species or perhaps variety of the Duiker now under consideration, is here designated by the English name, for an instinctive qualification in its manners, which in this particular resemble the true Duiker, and the specific name is that which Professor Lichtenstein has pointed out for this or the former species. There is so much similarity in the general aspect of the two species as to be easily confounded. The distinctions, however, appear to be, that the present is somewhat less in stature, or the size of a kid, more delicately framed, destitute of the prominent muzzle, the nostrils being almost ovine, and the horns scarce three inches long, bending outwards, with only three annuli, black, round, pointed, and without ridge in front ; between them there is a small black brush of hairs standing up like a feather ; the orbits are rather prominent, the lacrymary sinus a little prolonged, and shewing, midway between the eye and mouth, the small perforation of the lower pouch ; the face and forehead is of a rusty dun colour ; the sides of the head and external face of the ears, fawn ; a little white about the lips, throat, breast, lower abdomen,

and inside of the limbs; the ears are not four inches long, and whitish inside; the general colour of the neck and back is pale dun; a black streak passes from below the knees, covering the anterior part of the pastern, and a similar spot marks the posterior pastern; the tail is short, dun at base and black at the end. We have compared two specimens, both males, one from the Cape, the other from Western Africa.

Although there are marked distinctions between the three above-described species, and there is no direct evidence to shew that they arise from difference of age, of which Burchell's would be the old, and the present the young, yet it was thought preferable to place them under different names, particularly as the Ptoox, is both more daring and agile, and said to have a different voice.

The *Grimm*. (*A. Grimmia*.) This species is now distinctly known by the description of M. F. Cuvier, from the living animal: it is lower than the above, more clumsily built, but equally active and vigorous. The head is rather heavy, terminated by a prominent muzzle; the horns very short, stout, reclining, and almost concealed by the profusion of black hair covering the forehead, and rising between the horns to a point: this colour descends the whole length of the face; the ears are short and wide, white on the inside and pale gray on the outside; below the eye there is a lengthened slit, observed in several of the former, containing an unctuous substance, but no lachrymary sinus; the region about the eyes, cheeks, and side of the nose is fulvous-fawn colour, passing in a lower tint down the neck, shoulders, and flanks; the under jaw is white, and the lips and chin dark ash colour; from the withers to the tail, a broad bluish ash coloured streak covers the back and croup, mixing with the fawn coloured flanks, by an intermediate space of fulvous, which passes also along the buttocks and thighs; the tail is longer than

in the former, black, with a little fawn at the sides ; the posterior legs and internal face of the thighs are blackish ash colour, the anterior of the same tone having only a small streak at the back of the arm paler ; the female is more coarsely fawn, and ashy gray on the back and sides, but the black streak down the face is very conspicuous, ending in a broad pointed tuft above the forehead.

The male measures, from nose to tail, about twenty-seven inches in length ; the head six ; the stature at the shoulder seventeen, and at the croup eighteen inches : the pair were brought from Senegal, and were excessively active and timid. There is a skin of a fawn, probably of this species, in the British Museum, brought from Sierra Leone. It is eighteen inches long, the horns just pointing above the hair, seated far back, about half an inch in length ; the head is oval, with small muzzle, and a slit on each side of the nose ; the ears rounded at tip, mouse colour : general colour, dark brown and red gray.

Maxwell's Antelope. (*A. Maxwellii.*) A specimen somewhat inferior in size was brought home from Sierra Leone by Colonel Charles Maxwell. It was an adult female, which produced a kid while in captivity. Comparing this animal with the female Grimm, the differences are that its size is somewhat inferior and more elegant ; the head, seen in front, is squarer above the orbits ; the ears are longer and more pointed ; the muzzle is equally full and round, but beneath the eye there is a blackish spot, and low down on the cheek a puncture opening the pouch, corresponding nearly with the upper maxillary perforation ; the forehead and nose are dark coloured, with a streak on each side above the eyes, resembling brows ; between these and the eyes, the cheeks and sides of the face, the colour is pale dun ; the neck, back, and croup, dark brownish-dun, lighter on the flanks ; the inside of the ears, breast, internal face of the legs, and anterior part of the thighs and

belly, white; the mamma, four in number and pale yellow, form a small udder; the tail is two inches long, and black; the hoofs small, very pointed and black: the specimen lived two years in England. No decisive opinion can well be formed respecting the locality of the animal in a systematic view, while the male remains unknown, but it appears to form the passage from the present group to the next. We suspect this to be the *Philantomba* of the Sierra Leone Negroes; not uncommon there and yet not clearly described*.

The *Slate-coloured Antelope*. (*A. Carula*.) This species is known among the Dutch colonists at the Cape, by the name of *Blauwbockje*, and *Kleene Blauwbock*, or Little Blue Goat. The male, among the donations of Mr. Burchell to the British Museum, measures about twenty-eight inches from nose to tail, nearly thirteen inches at the shoulder, and fourteen at the croup: the head is rather long and pointed, with a small muzzle; no lachrymary opening is perceptible, but lower down towards the nose there appears an indication of a lower pouch; the horns are one inch and a half long, recumbent, with the tips turned upwards; they are round, black, and pointed, having five semi-annuli in front, partly concealed by the hair; the ears are rather short, open, and round, white on the inside; the back part, a space round the eyes and the legs, are buff; the face, cheeks, neck, body, and thighs, a slaty purplish-blue with a cast of brown, which predominates as the specimens continue to be exposed in a stuffed state; the lips, chin, a spot on the throat, the breast, belly, inside of the limbs, and anterior part of the thighs, white; the shanks, or cannon bones of the fore-legs, are seven inches

* Since writing the above, a gentleman, long resident about Sierra Leone, informs us, that the *Philantomba* is the animal noticed as a kid in the preceding article, in which case it is nearly allied to the *Kleenebock*, or *A. Perpusilla*.

long; the posterior to the houghs six inches; the pasterns only half an inch; the hoofs oval, three-quarters of an inch long, and horn colour; the spurious hoofs very small but distinct. A female in the Museum of Paris is smaller and lower, the blue colours more distinct, but less white about the belly or limbs.

There are good figures of this species in Mr. Daniell's *Sketches of Southern Africa*; its Dutch name *Blauwbokje* has caused it sometimes to be confounded with *A. Leucophaea*. The species resides in woods and bushy plains on the borders of the Cape Colony; it is fleet and cunning, and was formerly more common near Cape Town.

The *Kleenebock*. (*A. Perpusilla*.) This species is somewhat less, or about twenty-six inches from the nose to the tail; the head is shorter, more suddenly pointed to the muzzle; the form more graceful, but the make of the ears and the appearance of a suborbital sack as in the former; the colours in general are dull brownish-buff on the face and back, the limbs paler buff, and the throat, belly, and interior side of the thighs, white; the hair on the forehead is somewhat longer than on the face; the horns are black, conical, horizontally reclined, slender, and the points slightly turned inwards, and nearly two inches long; no lachrymary opening, but the lower slit visible. In the mouth the intermediate incisors are broad and in contact; the pasterns are rather long; the hoofs and the spurious hoofs very small. This species inhabits the under-wood and open forests of the interior of Caffraria, where it is known to the Hottentots by the name of Noumetje, and to the colonists by that of the Kleenebock: we consider it as perhaps a variety of the *Cærula*, but of a different species from the next.

THE NEOTRAGINE GROUP*.

In this section are included the smallest species of the

* *Neos*, *juvenis*, *γάρδος*, *hircus*.

genus. They are distinguished by an oval head, with a pointed snout, terminating in a diminutive muzzle; the horns are very small, lying horizontally on the top of the head, with a few annuli or semi-annuli to the front, and the base not concealed by the hair of the forehead, though somewhat lengthened, and retaining the Cephalophine character; the ears of all are short and round; the lachrymary opening is not as yet sufficiently investigated, but appears to be wanting in one species; there are no brushes on the knees, and the tail is short; the females are deprived of horns, and have two teats? These very delicate creatures are confined to Central and Southern Africa, living in solitude in the forests: their voice is said to be a loud and shrill warbling kind of cry.

The *Guevei*. (*A. Pygmea*.) It is the female of this species which has been so often confounded with, or caused the establishment of, the Pigmy Musk, a species altogether very doubtful; yet in this species there are two varieties, if not actually different animals. The larger *Guevei*, or Royal Antelope of Pennant, is about eleven inches high at the shoulder, and near twenty inches in length from the nose to the tail; the horns are one inch and a quarter long, placed high on the head, rather close, bulky at base, black, with one or two prominent annuli; then taper suddenly to a sharp point; there is a small lachrymary opening before the eye, no appearance of a sack beneath it; the muzzle is complete, round, and black; the ears are short, round, and lined with white hair within, and the outside, face, cheeks, upper lips, neck, back, thighs, and legs, are bright bay, more buff on the limbs; the under jaw, chin, throat, anterior part and inside of the thighs, white; the breast and belly grayish-white, mixed with yellow; the tail is short, hairy, bay above, and white beneath; the legs are very slender, the pasterns rather long, and the hoofs black; the spurious hoofs appear wanting in some specimens.

The females are smaller, hornless, and more dull in colour.

The Guevei Kaïor, or smaller Pigmy Antelope, is still less. A young female, which appeared to belong to this variety or species, was in Mr. Bullock's Museum; the size of the body scarcely exceeded that of a Norway rat; the head was round, with a short nose, no distinct muzzle, the eyes much nearer the mouth than in the preceding; the ears round, and the general colour a reddish orange, with a silky gloss, darkest and most vivid on the forehead and back; the throat, breast, and belly, white; nose, legs, and groin, buff; the ears, with a dark border, were translucent, white on the inside, and darkish on the back; there was a small dark spot at the anterior corner of the eye; two teats were observable, no spurious hoofs, and the tail was about three-quarters of an inch long, and rufous. It stood under a bell glass, and could not be more than eight inches high at the shoulder, the legs not exceeding the thickness of a large goose quill.

The Gueveis are brought from Guinea, but too delicate to survive a sea voyage; they are said to be prodigiously active in proportion to their size. Of the Guevei we have compared two specimens, male and female. The figure in the frontispiece of Shaw's *Zoology*, taken from the Leverian specimen, is the best published; the others seem to be of the Guevei Kaïor, of which we have seen several skins, all of females, and similar to that described. It is not rare in Ashantee.

Salt's Antelope. (*A. Madoka.*) Mr. Salt brought from Abyssinia the spoils of a small species allied to the above, and M. de Blainville noticed them under the name of *A. Saltiana*, from the fragment preserved in the Royal College of Surgeons. The head, deprived of the anterior part of the face, shews the horns with six or seven semi-annuli, the points slightly turned forwards; they are one inch and

three quarters long; the ears broad and oval; the eyes without lachrymary sinus, and probably without a pouch below; the hair on the head is very fine, short, and close, of a pale buff colour; but the dimensions of the legs, as given by M. de Blainville (for they no longer exist), make it doubtful whether they belonged to the same animal: they have very long pointed hoofs. It is known by the name of Madoka, in its native regions.

THE TRAGELAPHINE GROUP.

We preserve this group, with one exception, such as it was originally instituted by M. de Blainville. The species are few, uniting considerable elegance of form, with singularly-opposed colours; but their horns depart considerably from the true Antilopine type, having ridges, which give them an angular and compressed character, in some slightly twisted, spiral, or lyrated. They have a small muzzle, no suborbital opening, and the females, provided with four mammæ, are destitute of horns? This group resides chiefly in the deepest glens of woody mountains, living in solitude or in pairs, feeding in the night, and springing with great elasticity; they are timid and vigilant, and seem not to extend beyond Nigritia, and South Africa.

The *Boschbock*. (*A. Sylvatica*.) The Boschbock is one of those animals which unite elegance and vigour with a singular distribution of lively colours. The fine specimen in Mr. Burchell's collection, measured about five feet three inches in length, two feet seven inches and a quarter at the shoulder, and two feet nine inches at the croup; but there are specimens of larger dimensions. The head is seven inches, and the horns ten inches in length; the ears and tail each six inches; the horns are marked with an obsolete ridge in front, and another very distinct in the rear; they are placed high on the head, parallel with the face, and in their ascent are both spiral and lyrated, black, closely annulated, even

across the anterior ridge, to near the tips, which turn outwards and forwards ; the ears are narrow, but not pointed ; the neck is rather short ; the head, neck, back of the ears, body, shoulders, and thighs, are of a brilliant chestnut colour ; the inside of the ears, part of the under jaw, three spots along the cheek, one larger upon the throat, one on the shoulder, a narrow line along the spine, six spots near it, whereof three before and three behind the hips, five near the groin, and six low down near the anterior part of the thigh, are pure white, as also two lengthened spots on the anterior part of the upper arm, the belly, inside of the thighs, and the legs from the joints downwards. A white line on the back passes down the tail, which is dark at the sides ; the chaffron and lips are darker than the rest of the head ; the muzzle consists of a naked spot between the nostrils white or flesh-colour ; the hoofs are small and black. In the disposition of the smaller white spots there is some variation, but the larger are fixed.

There is a specimen in the Museum of Edinburgh, the horns of which are slender, about six inches and a half long, not spiral, but with a ridge in the front, and five or six annuli at base, the superior half smooth and wavy ; the colour of the fur is pale rufous, and the white spots less distinct and regular. This individual as been regarded as a female, but if the female be hornless, it can be only a young male ; unfortunately a partial mutilation renders the question doubtful. If the females be without horns, as asserted, they must also be much more difficult to obtain, for among the immense number of materials collected by us on this genus, not one occurs.

Sparrman and Alaman first described the Boschbock ; but the only good figure yet published is that in Mr. Daniell's *Sketches of African Scenery*. It is considered as affording good venison, the breast in particular being much prized. At present the species is chiefly, if not exclusively, found

in the Colony of the Cape of Good Hope, east of Camtoos River. It is monogamous, living concealed in deep forests, most active in the night, when its voice, consisting in a kind of barking, sometimes deceives travellers, inducing them to fancy that they are near human habitations, when, in fact, the voice of the Boschbock is a sure indication that they are far from the haunts of man. From some cause, not satisfactorily explained, the males are often found with the throat bare, as if worn off by running through under-wood; but that supposition does not agree with the invariable law of nature, which provides completely for the necessary circumstances of the assigned locality of its creatures; it is more probably the effect of disease, or of the attack of insects.

The *Harnessed Antelope*. (*A. Scripta*.) Mr. Adanson first noticed the Guib, or Harnessed Antelope, and Buffon both figured and described the male. It is an animal of considerable beauty, more slenderly formed than *Sylvatica*, about the size of a fallow-deer; four feet eight inches long, two feet seven inches and a half at the shoulder, and two feet eight inches and a half at the croup; the ears are five inches long, and the tail six inches; the horns of the male are black, about seven inches long, recumbent, or on the same plane with the face, placed high, straight, with a slight wave, rather stout at base, with two ridges twisting spirally one and a half turn round their axis; the eyes are without lachrymary opening, but the anterior lids are prolonged, and the muzzle is a mere naked space between the nostrils; the colour of the head, back of the ears, neck, back, flanks, belly, croup, and exterior side of the limbs, is a bright fulvous-bay; the nose, mouth, under jaw, throat, breast, a long streak upon the anterior part of the upper arm, the anterior side of the thigh, and a little about the hoofs, are white; two narrow white lines pass on each side from the withers downwards, in an oblique direction, one

to the flank, and the other towards the groin, both are intersected at right angles by two or three similar narrow lines across the centre of the back, followed by four or five others, but shorter across the croup; on the thigh are nine or ten small white spots; two others are near the cubitus of the fore-legs, and one or two on the cheek beneath the eyes, and the extreme edge of the buttocks, is white; on the belly the rufous is duller, and in the female that part, the throat and breast are wholly white. This sex also wants the darker tone on the middle of the forehead, on the posterior pasterns, and the streak more or less extended on the shanks of the fore-legs, as usually seen in the males.

Of this species we have compared a male and a female. It is found in the woods and plains of the country of the Jalofs, and on the Senegal. Professor Lichtenstein, and others, consider it as sometimes found in Caffraria; but Mr. Burchell, during his four years' residence in the interior, did not observe it, nor is the assertion of the colonists to be relied on, as their Bontebok is commonly applied to *A. Euchore*, and even to *Pygargus*.

The *Ribbed Antelope*. (*A. Phalerata*.) We separate from the Guib the present species, which M. Desmarests considered to differ only on account of nonage; but the constant recurrence of the same marks of difference in the specimens we have examined, warrant the opinion of a difference of species. The horns are small, three or four inches long, reclining, conical, not compressed, without ridges or transverse protuberance in front. Although the animal is altogether smaller, the forehead is comparatively broader, the nose shorter, and terminated by a small black muzzle: the fur is less vivid in colour. A black line of hair passes along the spine, edged on each side with white, commencing on the withers, and terminating at the root of the tail; from each of the white lines nine others descend perpendicularly in the form of narrow ribs, without, however, unit-

ing with a second transverse line, which commences on the middle, or at the insertion of the shoulder blade with the humerus, and passes obliquely downwards to the groin. On the thighs are nine or ten white spots; the white lips and chin, two similarly-coloured spots on the lower jaw, and one on each side of the anterior angle of the eye, with a dark blackish spot between them, mark the face; the tail is long, reaching nearly to the houghs, bay above, white beneath, and black at the end; the rufous colour extends over the belly, the posterior part of the arm, and hind-legs, leaving a lengthened white streak from the point of the shoulder towards the knees; from thence the legs are anteriorly dark to the pasterns, and posteriorly white; the anterior part of the thighs and hind-legs to the hoofs are likewise white, with only a dark spot above the pastern; the hoofs are rather high, and appear more enlarged than in the former.

There are, we believe, in the Paris Museum, three specimens of this animal, one male and two females. We have seen a male and female in London, and have possessed the skin of a kid nearly adult, which differed from the former only in the rufous colour being more yellow, the streaks on the back being more distant from the spine, and the four lumbar transverse ribs ending in round spots; besides which there were twenty-one others on the flank and croup, and the lateral streak commenced behind the elbow, with two additional white spots further forward on the shoulder, and two others near the junction of the neck and withers. The length of this skin was not quite three feet six inches, and shewed that the white spots disappear gradually, as the lines become more distinct and extended; but also that the dorsal white lines approach with age towards the spine, rather than descend to the flanks. The London specimens were all, we believe, brought from the expedition up the river Congo; and it is worth observing, that Professor Smith, in the few notes of his hand which have been pre-



THE CAMBING OOTAN.

ASUMATRENSIS.

in Smith Esq. del.

18.

London: Published by G.D. Whitaker, 1843.

served, notices the sight of herds of a small species of Antelope striped with white; and as he was thoroughly versed in Zoology, he would have recognised them to be the *Scripta*, if he had not considered them as of a different species. Hence, also, it is probable that they differ in manners from the former; and we find that they reside on the barren plains above the great falls of the Zezere, or Congo.

THE NEMORHÆDINE GROUP.

Several of the latter groups shewed a gradual decline of the typical characters of Antelope, both in the horns and limbs, approaching more and more toward the genus *Capra*, and the present appears still more nearly allied to it. The deer-like conformation of their structure is not only replaced by robuster forms, but the head assumes a Caprine shape; the mild dark eye of the true Antelopes gives place to the yellow or light hazel pupil; the skull is solid and heavy, but the horns still retain a round and falcated character, which is intermediate between the *Cephalophine* *racemus*, and *Capra*, and some shew the pouch upon the intermaxillary bone, and the muzzle common to the former; on the other hand, the legs, and the character of the hair, which is coarse, and often shaggy, belong to the latter. They seem to have, invariably, a white mark on the throat: the females are hornless, and have two mammæ? They reside principally in the forests and high mountains of Central Asia, and of the great Indian Archipelago.

The *Cambing Ootan*. (*A. Sumatrensis*.) Mr. Marsden first described this species in his history of Sumatra, and a specimen was formerly preserved in the British Museum. The Malay name signifies wood-goat; and it would appear that there are varieties, if not different species of this animal, on the neighbouring islands. The body, limbs, and form of the *Cambing* are compact, measuring about four

feet six inches in length, from the nose to the tail, and two feet four inches in height at the shoulder; the muzzle is broad, black, and moist; the suborbital sinus is considerable, secreting a yellowish viscous humour through a narrow opening, and shewing, on each side upon the intermaxillary bone, a naked and smooth streak of eighteen or twenty lines in length; the horns are six inches long, rather stout at base, nearly reclining with the plane of the nose, recurved one inch distant below, three inches at the tips, furnished with ten or twelve wrinkles and annuli, and the points smooth; the middle incisors of the teeth are very broad, and the lateral not overlapping, but touching and spreading outwards; the head and body is entirely covered with black hair, close upon the sides of the face, longer and rougher on the body; but the neck from behind the horns to the end of the withers is furnished with white hair, still longer and very abundant, forming a kind of mane; from the corners of the mouth the under jaw and gullet are likewise covered with long white hair, mixed with some yellowish; the legs are black, and the tail of the same colour is short, and furnished with longish hairs; the hoofs high and strongly resemble those of a goat; the female is without horns, and has less white about the neck and throat.

A drawing which we copied from an original in the possession of a Dutch gentleman, represented an animal of this genus, probably a variety, said to be from Malacca. In this the face, from the nose to the middle of the forehead, was distinctly marked with a chaffron of long and coarse black hair, the cheeks, neck, and body being bluish ash, and the fur short and shining; on the withers a small tuft, and beneath the under jaw a small spot of white. In other respects resembling the Cambing, but more slender and elegant in form.

The species resides in the mountain forests of Sumatra,

and is represented as singularly active and lively. We have seen the spoils of two males; the head and skulls of both sexes are in the Royal College of Surgeons, and several drawings, among which those transmitted to M. Cuvier by the late M. Davaucel.

Davaucel's Antelope. (A. Davaucelii.) This provisional name is proposed for an animal of this group, the figure of which was sent with the above by M. Davaucel; but we believe the description never reached M. Cuvier. Judging from the drawing, it may be considered an animal nearly allied to the Cambing Ootan, somewhat higher at the shoulders, equally robust in the limbs, and about the head, but with horns still more recumbent, apparently less annulated and straighter; the lachrymary opening not perceptible; the muzzle smaller; the hair closer and shorter; the tail a little longer; the colours entirely ashy gray-brown, more rufous on the inner face of the limbs and thighs; the lips and chin, lower part of the jaw and gullet, white; a small white mane from the nape to the withers standing erect, or reclined backwards, edged at the base with a black line; the hoofs are longer and more pointed than in the preceding.

M. F. Cuvier permitted us to take a copy of the original drawing in his possession; the *habitat* is unknown to us.

The Goral. (A. Goral.) The Goral is in size equal to the Common Goat, being three feet one inch in length, and two feet at the shoulder. The head is conical, rather compressed and tapering suddenly from the eyes to the snout, very wide across the cheeks, and narrowing toward the forehead; the horns are black, four inches and a half long, subulate, approximating at base, gently bending backwards and slightly diverging; they are smooth, excepting at their base, which is marked with five or six rings, occupying about one-third of the whole length; the eyes are rather large, of a dark brown, surrounded with a circle of whitish

hairs, and long, slender, and black eyelashes; the ears large, five inches in length, ovate, erect; hairs within white; the neck proportionably long; body roundish, the back a little arched, having the appearance, without the reality, of being higher at the rump, but shewing the natural position of the animal ever prepared to leap; from the rump to the tail the croup is much sloped; the legs are slender, well formed; the hoofs black; the tail slender, tapering, about four inches long; the general colour is the gray-mouse (almost white about the lower part of the neck and throat), and darker, with the hair longer upon the upper part of the neck and back, inclining to ferruginous about the legs. The female differs but little; has no horns, but in their place appear two prominent tubercles covered with a tuft of dark brown hair.

A pair were presented by the Court of Katmandoo to the resident, the Honourable E. Gardner, and the male lived in the Governor-general's Menagerie at Barrackpore. It is a native of the Himalaya range, and mountains of the Nepaul frontier, and considered by the natives as the most active of the Antelope genus. It is seen in numerous herds, shy and rarely taken, excepting by stratagem. If pursued, they disperse and fly to precipices and places to which no dogs can follow them. General Hardwicke, from whose description this account is extracted, states, in proof of its agility, shewn within a space of about ten feet square, enclosed by stakes eight or nine feet high, that the animal attempted to spring over, and at every leap so nearly effected its purpose, as to appear in imminent danger of being staked. Its flesh is considered as delicate venison. We possess a drawing, probably of the same individual, under the name of the Bouquetin, or Ibex of Nepaul, for which we are indebted to the kindness of M. F. Cuvier, who received it with others before noticed. In the drawing we find the ears marked with the usual striæ, and the chin,



THE CHAFFIN

London, Printed by G. & W. F. Woodcut, 1840

lower jaw, and gullet, pure white; there is also a small lachrymary opening before the eye. This circumstance if correct, and the want of a heavier fur, indicate that the species does not elevate itself beyond the secondary ranges of the mountains.

THE RUPICAPRINE GROUP.

Of this group, receding still more from the Antilopine type, one species only is known, though its varieties range over a very large extent of country, being found in the Caucasian Mountains, the Demavend range of Persia, the Alps, and the Pyrenees. Its principal distinctive characters reside in the horns, which are vertical to the plane of the face, posteriorly uncinated, round, longitudinally striated, and dark brown in colour: behind the horns, on the posterior part of the head, are two small apertures, the use of which is not ascertained. The limbs are strong and resemble those of goats; the hair rather long, especially in winter, and a dark streak passes through the eyes from near the horns, towards the mouth; the tail is short. Both sexes are provided with horns, and the females have two mammæ; they have neither suborbital sinus, nor tufts on the knees, but in common with the true Antelopes, they possess inguinal pores, and the ovine form of the nostrils. Although this group is usually considered as most remote from the type of the genus, we find no signs to separate them more decisive than may be observed in the Klip-springer, the Chickara, the Chiru, the Prong-horned, or the Cambing Ootan.

The *Chamois*. (*A. Rupicapra*.) This animal, in its external appearance, bears a great similarity to the Goat, especially during the cold seasons, when the hair is longest. It is in stature about equal to the Roebuck, but more corpulent and massy in its proportions; the head resembles a goat's with the nostrils more pointed and forward; the face

is straight ; the ears longish and narrow ; the eyes similar to those of the Goat, and the incisor teeth as in the Common Antelope ; the horns are six, seven, and even eight inches long, slender, round, striated, and terminated in a complete posterior hook ; they stand vertically on the head, and are common to both sexes ; the tail is short and black ; the hair is of two qualities upon the neck and body, the superior and longest brown, varying to gray with the seasons, and the inferior short, woolly, close and gray ; the face, cheeks, and throat, are yellowish white, with a broad band passing rather beneath the eye, to near the corner of the mouth, and the rump, similarly coloured, has a darker streak along the edge, where it unites with the longer hairs of the croup ; the legs are brownish ; and the hoofs solid and strong, have their outer edges higher than the soles.

The Chamois is known to inhabit the wildest and most abrupt regions of high mountains, but does not ascend to those elevated ranges which the Ibex alone delights to visit : more feeble in its nature, the valleys of the Glaciers form the limit of the temperature it can bear, and the woody belts beneath them, the verge below which it seldom descends. Its physical strength is thus in harmony with the localities it prefers. Although in vigour and activity the Ibex stands pre-eminent, the Chamois is next, running with rapidity along the most perpendicular ledges, springing across precipices, and bounding from rock to rock with a steadiness and security truly wonderful. We have seen it leaping down a precipice, sliding first the fore-legs down the steep, while with the spurious hoofs of the hind-feet it held the edge of the rock with firmness, till the centre of gravity was lowered as far as possible, then, bounding forward, by a jerk of the body during the descent, turn the croup under, and alight on the hind-feet first, with such apparent ease, that the fore-feet dropped close to the hinder and all expression of effort vanished. These descents

we have witnessed from more than twelve feet, and it will not hesitate to leap down twenty, and even thirty. Upon the snow of the Glaciers it runs with equal security, but upon smooth ice it slips and is awkward.

Chamois are sociable in their manners, living in herds, from fifteen to twenty strong, and sometimes in greater numbers. The old males alone remain isolated, excepting on the approach of the rutting season, when they join the herd and expel the younger males to keep undisputed possession. The season commences in Europe about the end of October or November, and in March or April the females retire to drop their kids, who remain with the mother until the following season, and their longevity is estimated at twenty-five or thirty years. Their food consists principally of the richest mountain herbs, and particularly of those which are considered as medicinal, such as the *Carlina Acaulis*, and *Artemisia Glacialis*, and it is probably for that reason that their blood has been held specific in pleurisies. In winter they feed on the buds of juniper, firs, and pines. In Switzerland they have been observed to lick with avidity certain sandstone rocks, most likely on account of a saline impregnation which they may contain. Their feeding time is mostly in the morning and evening, seldom in the middle of the day. Heat is unwelcome, yet in winter they usually seek the sunny flanks of the mountain, while in summer the northern aspects are preferred. Notwithstanding their habitual residence among precipices, it has been remarked that they are even more subject to fits resembling apoplexy than the Common Goat.

The usual voice of the Chamois is a hoarse bleating; it is the mutual call of the herd; but when they are alarmed they send forth a shrill whistling note, to give warning to their companions: they are shy, vigilant, and keen scented. The herd neither feeds nor reposes without some among them being stationed to watch, looking out from a pinnacle

or precipice, particularly to leeward of their haunts. On the approach of danger, or of a strange object, the shrill signal is given and repeated by all; the youngest trip off to windward, while others in great agitation skip from rock to rock to reconnoitre, until they are re-assured or move off; but always, while choice is left them, in an ascent towards the more inaccessible cliffs. If the hunter pursue them until one is driven to some point from whence there is no further retreat, it is said that it will pitch itself headlong downward upon its foe and dash him into the abyss below. Although the males emit even a stronger odour than the he-goat, the venison is much esteemed. A carcass produces from ten to twelve pounds of suet, and the uses of the skin for gloves and clothes is well known.

The species is now much rarer than formerly in the Swiss and Savoy Mountains, but the Tyrol still contains a considerable number. In Carniola, the Carpathian and Grecian Mountains, where they are named Carnusa, few remain. Mr. Haller informed us that two distinct breeds, if not varieties, reside on the Alps; the larger, or Chamois of the Woods, with long rough hair and delicate venison, and the smaller, or Chamois of the Glaciers, with shorter hair, also furnishing very palatable venison, provided it be dressed very soon after the quarry is slain, for otherwise it becomes very soon fetid and useless. Notwithstanding its averseness to quit the wildest mountain scenery, the Chamois is said to mix sometimes with cattle and goats; and it certainly can be partially tamed. In that state it evinces all the mixture of impudence, timidity, and curiosity observed in goats. One kept in an enclosure, shewed at first great signs of shyness to us, but was so soon reconciled that in a short time it came behind us to look erect over our shoulders on the paper, steal the drawing implements from a chair, and if looked at, to bound away for a few yards and return again; when forced in a cor-

ner it lay down and suffered itself to be handled very quietly.

Of the species we have seen a great number of individuals, and from different countries. One larger than the European, with the horns ten inches long, measured upon the curve, came from the eastern shores of the Black Sea, and the Caucasian Mountains; it had short hair, was more uniformly brown, with the face, throat, and buttock ferruginous, and the black streak across the eyes very broad; the legs were pale buff.

The Yzard or Pyreneean variety, may be the smaller, or Glacier breed of Mr. Haller. It is smaller, the hair short, the fur a mixture of dun and gray on the back; rather a lively buff on the cheeks and throat; the usual dark streak beneath the eye, with a black arch above them, and a bright ferruginous one immediately beneath that and above the eye; the forehead, lips, and chaffron, whitish; a dark line from the corner of the ears, passing round the buff of the throat, and a faint dark line on the flanks, as in the Dorcas; buff buttocks, having another black line next the gray of the croup; the legs pale buff.

The Persian variety is of the same size as the Yzard, with one kind of close short hair of a rufous-dun colour, paler on the face and extremities, the dark streak begins beneath the eye, and is less distinct; the horns are shorter and bend with a greater curve backwards; the buttocks are white, and the legs more slender than the above.

THE APLO CERINE GROUP.

We have seen in the former divisions of the genus, a gradual evanescence of characters, from the deer-like forms and other attributes of the Antilopine type, till we have reached those where the predominance seemed to bear towards *Capra*. In the present, however, equally remote with the two last from the primitive characters, there

appears to be an approximation to *Ovis* in the forms of the animals, though the horns still retain the structure which prevails in the *Næmorhædine* group, and indeed so closely, that if other distinctions, and an immense geographical distance did not interpose, they might have been left in the same racemus. The horns of the *Aploceri* are simple, conical, obscurely annulated, the points bent back; they have no lachrymary sinus, no black and moist muzzle, no inguinal pores; their skulls are solid and heavy, their limbs strong, the tail rather short, and they are exclusively confined to the western hemisphere. The want of a lachrymary opening in this and other ruminating groups is most commonly an indication of their residence being confined to high latitudes, or elevated regions, and the remark is verified in the present case, at least as far as the only species perfectly established is applicable, and not disproved by those whose existence is more problematical.

Woolbearing Antelope. (*A. Lanigera*.) This animal was first noticed by the Spanish missionaries in 1697, and subsequently by Venegas, in his *History of California*. Captain Vancouver afterwards brought a mutilated skin to Europe, and the late Lieutenant-general Davies presented a complete specimen to the Linnæan Society of London. From this subject M. De Blainville published a notice under the name of *Rupicapra Americana*, in 1816. About this period Messrs. Lewis and Clark returned from their valuable travels, and brought another imperfect skin, from which Mr. Ord drew up his notice under the name of *Ovis Montana* in May 1817, and in the same year a more detailed description, chiefly taken from the specimen in the Linnæan Society, was drawn up and afterwards published in the *Transactions*. vol. xiii. Some additional information relative to the species was derived from the Indians, and particularly from a memorandum drawn up by Donald M'Kenzie, Esq., chief factor of



the Hudson's Bay Company, transmitted by Major Long to the government of the United States, and inserted by Dr. Harlan in his *Fauna Americana* in 1824*.

The various locations where this species has been placed in systematic catalogues, shew that the anomalous mixture of characters in the animal, demand at least a subordinate division, somewhere intermediate between the Antelopes and Capræ. While the structure of the horns is held as a chief character for the larger division of the genera, no alternative remains, and our proposed subgenus, or racemus *Aplocerus* must be derived from the *Antilopina*: for the compact structure, ovine or caprine chafron, and presence of wool on the body, are characters found, as we have seen, in others of the genus. Hence, while the horns of goats are designated as compressed and nodose, those of sheep as angular and spiral, the *Aploceri* cannot range among them; nor while the characters of *Rupicapra*, consist in horns without annuli, but smooth and striated, is that section fit to admit them. The group *Næmorhædus* alone might answer, but we have stated the reasons, which, for the present at least, render it preferable not to unite them, and when both these groups shall be better known, there is little doubt that other causes of separation will be discovered.

Notwithstanding the notices published since the paper in the *Linneæan Transactions* was produced, we find few additional particulars to add to that description. The animal is equal in size to the largest sheep; the nostrils, ridge of the nose, and position of the eyes, resemble a ram's,

* This gentleman claims the priority of description for Mr. Ord, which, however singularly enough, is disproved by that able Zoologist himself. We have been particular in stating the dates to settle this point, as with the claim is coupled the right of imposing the specific name; but that question the learned world will determine. Vide *Journ. of the Acad. of Nat. Sciences*, vol. i. part i. Harlan's *Fauna Americana*. *Bull. Soc. Phil.* 1816. *Lin. Transactions*, 1821.

though the chaffron may be something more straight than in the ordinary breed ; the ears are rather long and pointed, filled inside with long hair ; the neck appears short, and the whole structure of the animal exceedingly robust ; the colour is wholly white ; the bulk of the body considerably increased by a thick coat of long straight hair, of a yellowish tinge, but softer to the touch than that of a goat : this hair is particularly abundant under the throat, about the shoulders, the neck, back, and tail ; it covers the upper arm and houghs of the animal ; beneath it, lies a close downy wool of a clear white colour, and in young animals feeling like unspun cotton ; on the face and legs the hair is short and close, similar to that of sheep ; the eyelashes are white, but it has no beard properly so called, that appearance resulting from the profusion of long hair on the side of the face, and under the throat ; the horns are about five inches long, above an inch in diameter at base, bending slightly back, having two or three obscure annuli, then striated, and ending in a point* ; the females probably have none ; the legs exceed in thickness those of a large calf ; the fetlocks are short and perpendicular, and the hoofs black, high, broad, and with deep grooves in the soles.

We are indebted to Dr. Harlan's *Fauna Americana* for the following details respecting the manners and residence of the animal. It appears that Messrs. Lewis and Clark observed it as low as the forty-fifth degree of north latitude, but that its chief residence is on the elevated regions of the Rocky Mountains, between the forty-eighth and sixtieth parallels of north latitude. It is found in great numbers near the head waters of the north fork of the Columbia River, where the flesh constitutes the principal food of the

* Dr. Harlan has justly objected to the marked character of the annuli in the figure published by the Linnæan Society ; it is not so in the original drawing.

natives. The banks of the sources of muddy rivers, Saskatchewan and Athabasca Rivers are also inhabited by these animals; but they are said to be less numerous on the eastern slope of the Rocky Mountains, than upon the western. They are seldom or never seen at a distance from the mountains, the climate and productions of which appear best adapted to their nature and mode of life. In summer they resort to the peaks and ridges in quest of pasture, but retire to the valleys in winter. In their native regions the long hair stands erect on the surface of the body, which gives them a shaggy appearance, and the wool of the head is so long as nearly to conceal the horns. Their flesh has a musky flavour, and is at best unsavoury. They are easy of access to the hunter, who seldom pursues them unless compelled by hunger. Their fleece is esteemed of little value by the traders, and is used only as a covering to the feet during winter: the skin is of a remarkably thick and spongy texture. It has been asserted by good judges that the silky fineness of the wool is not surpassed by that of the Cachmere Goat; and it is, therefore, to be regretted, that the patriotic intentions of naturalizing this animal, as expressed by the late Lord Selkirk, were not carried into effect.

M. Rafinesque's *Mazama Dorsata*, and *M. Sericea* appear to be the young and adult of this species; the name *Mazama* was certainly understood in a generic sense by the natives of North America, and extended to animals of the present family, but the greater number were deer. For these reasons we applied it to a group of the genus *Cervus*, retaining only the specific application of it to the following species, which we find were designated as such by anterior writers.

The *Ovine Antelope*. (*A. Mazama*.) There is in the *Linneæan Transactions*, vol. xiii., a notice of this species, which bears so great an affinity to the last mentioned in all the

essential characters, that it may be only a variety of climate ; for with the exception of the colour, and character of the wool and long hair, which are the natural companions of a severe climate, we may ascribe the rest to the residence of the present species within the Tropics, and where even the Andes are comparatively low. On the other hand, ruminating animals do not seem in a state of nature, to extend themselves over latitudes of extreme different temperatures ; if they are found so sometimes geographically, it will be observed, that they have followed high chains of mountains, where the difference was locally not considerable. In that paper the Mazama is noticed as inferior in bulk to a domestic goat, but higher on the legs ; in aspect resembling a small lean sheep, with soft hair instead of wool ; the horns about six inches long, obscurely annulated at base, dark-coloured, round, bent back, and pointed ; the ears rather large ; the head thick, and the neck short ; the nose shaped as in sheep ; the colour pale rufous-brown ; the inside of the limbs, breast, and chin, dull yellowish-white, and darkish gray beneath the eyes and about the nostrils ; the tail thick and short ; the legs rather stout ; the hoofs black, and the whole animal somewhat heavy in its proportions. These characters agree with the Mazame of Seba, table xlii., figure 3 ; and on referring to the unique-coloured copy of the work in the British Museum, we find it there pale chestnut-brown, paler beneath, the cheeks pale, with a dark longitudinal spot beneath the eye, and the horns black.

We have lately seen several horns which appear to belong to this animal, said to have been brought from Panama. The above description was cursorily made from a specimen killed by the Mosquito Indians in the rocky forests not far from the River St. Juan, and the Lake of Maracaibo. It may be the Pudu of Molina, but that author's account seems to agree better with the next, if that

be not also a variety or a young individual of the Mamazame.

The *Chichiltic*. (*A. Temmamazama*.) In the above-mentioned paper, this supposed species is likewise noticed as derived from a drawing taken from a specimen shot near the sources of the Red River, or towards the base of the mountains of New Mexico; but no additional information has been obtained on this head. Its form is light and slender; the nose small and ovine; the ears long, narrow, and rounded at tip; the tail several inches long, and often carried erect. Its size equal to a kid; the horns about five inches and a half long, black, slender, wrinkled at base, lying straight along the prolongation of the forehead, diverging and bending back at a slight angle; the eyes dark and full, and the colour that of a roebuck, with some white on the throat, belly, and inside of the limbs. This description agrees with *Ovis Pudu* of Molina; but the figure in Seba, and still more the description coincide, excepting that ours appears a young individual: he says in the explanation of table xlii. figure 4, that "the Macatl Chichiltic, or Temmamazame, ranges in great numbers along the elevated mountains of New Spain, feeding on grasses and herbs, and that they are fleet and active in leaping; their horns are spirally annulated, ending in a point, increasing annually by an additional ring, which marks their age; they are dark coloured; the ears and eyes large; the teeth broad; the tail furnished with longish hair, that on the body shorter and wholly brown." In the illuminated copy before mentioned, the figure is entirely pale chestnut-brown, and the horns black. In *Hernandes*, page 325, we suspect the description to refer to a deer of the Broket group; both, however, figure their animals with heavier proportions, and in this respect are probably right.

Considerable doubt is generally attached to characters derived from mere drawings, especially if they be without

satisfactory notes, or by unknown hands. These objections attach, in part, to the last-mentioned animal; and from the circumstances under which we saw the former, sufficiently explained in the original communication, some doubts will remain even respecting that species. It is true they coincide with Seba, and the figures in Hernandez and Recchi, but still a more satisfactory testimony is desirable, and they are entered here with a view to excite the inquiries of future travellers who may be more fortunate than ourselves, leaving it to the nomenclator to admit or reject the evidence produced. Our view on this subject differs from the arbitrary system which assumes upon its own authority the right to believe or discredit the recitals of others, who had intellect, eyes, and judgment, as well as ourselves; and we deem it more for the interest of science to admit, in their proper places, and with the signs of uncertainty, such documents as are new, and not yet fully substantiated, than to reject them altogether as unworthy of notice. Time has proved Bruce, notwithstanding the incredulity of Zoologists, to have been right in all the subjects that have been in the way of verification; and many other instances shew that the natural sciences are more likely to gain than lose by the practice.

THE ANOINE GROUP.

We have now to consider the last species which we refer to the great genus *Antelope*, though there is little doubt that when its history and characters shall be fully known, an absolute separation will be the consequence. In the present state of our information, it demands, at least provisionally, a location in a separate group, which we designate, we must confess, by a name offered more from inference than from proof sufficiently clear. The characters by which to separate it from all the foregoing, are—horns placed on the edge of the frontal crest, on the same plane

with the face, exceedingly robust, a little depressed, subtriangular, short, straight, wrinkled, and suddenly terminating in a very sharp point; the face straight, no lachrymary or suborbital opening?

The *Anoa*. (*A. Depressicornis*.) The specimens from which the following descriptions were taken, are one in the British Museum, and the other presented to us by Dr. Abel, is at present deposited in the superb collection of Mr. Brooks. The first consists of the bones of the face, with the hair and horns on, measuring about nine inches from the nose to the base of the horns; the muzzle is very broad and naked; the forehead and chaffron straight, rather narrow, covered with bluish cinereous hair, short, close, and feathering beneath the left eye; the sides of the maxillæ are cut away, leaving it doubtful whether there was no sack on the jaw, though no lachrymary sinus, for the flat surface of the lachrymary bone is partly preserved; the horns are ten inches long, straight, very robust, a little depressed at base, and flat on their anterior side, subtriangular to about two-thirds of their length, then tapering suddenly to a sharp point; from the base to more than half their length they are nearly of equal thickness, rudely and irregularly wrinkled, and of a dark gray colour. A memorandum within the head states that it was brought from the Island of Celebes.

Our learned friend Dr. Abel, who, probably, was the donor of the above, presented us with what he termed another of the same description, and we thence infer from the same place, no doubt procured by him on his return from China in the suit of Lord Amherst. This head is somewhat less; the horns are shorter, rounder at the back, less wrinkled, and the contraction to form the point begins near the middle of their length; the hair of the face is almost black. This fragment may be of the young animal, or the female; but the horns of the other specimen are sufficiently

bulky to form legs of a low seat, and must be dangerous weapons on the head of the animal. Their structure and native country induced us to apply to them the name of Anoa, because in a note of the late Governor Loten we find the Anoa described as a small buffalo of Celebes, not larger than a middling sheep, gregarious in the mountains of the island, and so fierce, even in confinement, that some of them being kept in a paddock, along with several stags, they ripped up the bellies of fourteen in one night.

The form of these horns have, in fact, a mixed character, which bears some resemblance to those of a buffalo, and hence it is likely that the animal is considered by the natives as one of that species. It is not impossible that it may be ultimately classed in the genus *Damalis*, and subgenus *Portax*, but we believe the female to have horns. Mr. Pennant classed the Anoa among the Buffaloes.

THE GENUS CAPRA.

It is a fact of a singular nature, that as far as geological observations have extended over fossil organic remains, among the multitude of extinct and existing genera, and species of mammiferous animals, which the exercised eye of comparative anatomists have detected, no portions of Caprine or Ovine races have yet been satisfactorily authenticated; yet in a wild state, the first are found in three quarters of the globe, and, perhaps, in the fourth; and the second most certainly exist in every great portion of the earth, New Holland, perhaps, excepted. It would almost seem as if this class of animals were added, by the all-bountiful hand of Providence, to the stock of other creatures, for the express purpose of being the instruments which should lead man to industry and peace, at least such an effect may, in a great measure, be ascribed to them; and if not the first companion, the goat may, nevertheless, be regarded as the earliest passive means by which mankind entered

upon an improving state of existence. The Dog, by an innate inclination, may have associated himself with the fortunes of human nature at a still earlier period, but his society could lead no further than to mutual assistance and protection, not to civilization ; while the Goat and Sheep, the best fruits of the united exertions of man and his canine associate, first slain and devoured, then caught, tamed, and reared (for there appears a natural inclination in these animals to familiarize with us *), must have furnished obvious inducements to abandon the precarious life of a hunter, perhaps of a cannibal, to relax in the pursuit of his carnivorous wants, for the more peaceful, more humane occupations of pasturage, and its consequent allurements to gradual improvement, such as the arts of clothing and of building. A gift of nature so evidently important to mankind, led to its usual effect upon minds without cultivation. The wandering shepherd guided his nightly course by the stars ; he observed the connexion of the seasons by the passage of the sun through certain portions of the heavens ; he named the stars within this range, after the objects most familiar to his mind, and his zodiac was formed with *Capricorn* and *Aries* among its members or houses. These names, at first applied for the purpose of divisional designation, as they stood connected with real or supposed duties or events relating to pastoral life, gradually acquired the character of sacred ; and the same minds which had selected them from common objects, by no uncommon transition, typified them with characteristic attributes, and then

* Buffon relates a fact in support of this opinion, and a similar thing has happened to us when landing on a precipitous and wooded bank on the side of the lake of Thun, where these animals breed, and are only occasionally removed by the owners, some goats and kids came bleating to us, went directly into the boat, and required some effort before they would retire, although they wanted neither food, water, or shelter, and in that wild country they cannot be familiarized with human beings.

regarded their representatives as objects of veneration, of hope, or of fear. In the early mythologies, Pan, the supreme power over nature, is portrayed with the insignia of the Goat, and the Lybian Jupiter with the horns of the Ram ; Osiris, or the Sun, during the vernal period of the year, assumes the same characters ; and the Grecian Jupiter and Minerva claim alike the *Ægis*, or Goat skin, for a breast-plate. Both the Goat and Sheep were held sacred to one or more divinities, and sacrificed at their altars. In the Jewish law they were likewise sacrificed, but not with the same intention ; for here the Goat was expressly marked as emblematical of atonement, and in the christian dispensation, the beautiful image of exalted innocence bearing the sins of mankind, is still retained in the figurative designation of the Lamb.

The skins of these animals were, probably, among the first materials employed for clothing ; afterwards the long hair of the Goat was mixed up with the short and soft fur of other animals, and united with the gum of trees, or animal glue, manufactured into that coarse but solid felt, known in Northern Asia from the earliest ages, and noticed by historians and poets. It was probably of this material that the black war-tunics of the Cimbri were made, in their conflicts with Marius ; and we know it was the winter dress of the auxiliary Cohorts, and even of the Roman Legions in Britain, at least to the period of Constantine. But long before this era, the gradual advance of art was felt, even in the depth of Northern Europe ; the distaff had reached the Scandinavian nations, as well as we find it subsequently in the hands of the Mexican ; and the thread, at first platted into ribbons, afterwards enlarged and wrought like matting into a kind of thrum, was at length woven into narrow, and last of all into broad, pieces of cloth. In the ribbon plat (*i. e.* plaid,) we see the origin of the check dresses common to most nations of northern lati-

tudes during their state of incipient civilization; for these were made by platting the ribbons into broader and warmer pieces: the stripes almost universal in the south, were the same plats sewed together. That goat's hair was the chief ingredient among the Scandinavians, is proved by their divinities being dressed in *Geita Kurtlu*. The Domestic Goat in the north and west of the Old World, preceded sheep for many ages, and predominated while the country was chiefly covered with forests; nor is there evidence of wool-bearing animals crossing the Rhine, or the Upper Danube, till towards the subversion of the Roman Empire. In Spain, Southern Gaul, Italy, the shores of the Black Sea, and Greece, the case is otherwise; it may be conjectured that the mythological romance of the Argonauts rests upon the first importation of the breed of sheep into the land of taste and genius.

It would be difficult, if not impossible, to substantiate the descent of the present domestic breeds of goats from any one particular species still found in a state of nature, if the probabilities were not that two, at least, if not all, have served for that purpose, or have subsequently intermixed with them; for although the characters of the horns are in this genus sufficiently diversified, they retain, nevertheless, a clear typical structure, even in the Jemlah species, and the several races, however debased by domesticity, resume more or less of the normal form, when restored to their original independence under congenial circumstances.

The genus *Capra* is distinguished from *Antelope* by the osseous nucleus of the horns being partially porous or cellular, communicating with the sinus of the frontals. The direction of the horns is upwards, bending to the rear, more or less angular, compressed, nodose, and transversely wrinkled; they are common to both sexes, but smaller, less angular, and straighter in the females; the line of the forehead and chaffron is rather convex; the eye of a light brown

or yellowish colour, with a lengthened dark pupil, has a lively and independent expression; there is no suborbital or lachrymary opening beneath the eye; the nose is without a muzzle, leaving only a narrow naked space between the nostrils; a beard adorns the chin of nearly all the males; the ears are narrow and rather rounded at the tips; the tail is short, naked below, often carried in an elevated position, and the fur is not very coarse, but of different lengths and colours, and accompanied beneath by a close woolly down; the legs are strong and thick, with a small callosity on the carpus instead of a brush; the hoofs are high and solid, supporting rigid perpendicular pasterns. The females are furnished with two mammae, forming an udder; their time of gestation is five months, and the young female is capable of propagating at seven months old: two kids are usually produced at a birth. The male requires one year to develop his faculties, and one is sufficient for a flock of one hundred goats; but at six years of age he is already old, though the life of this genus extends to fifteen. At all times, but more particularly during the rutting season, the males emit a powerful smell; they are libidinous, and contend for the possession of the females by butting with their horns, not in the manner of the Stag or Bull, by running low at each other, but by standing on the hind-legs and striking with their whole weight obliquely downwards. During these conflicts they mutter abruptly, lick their lips, and paw the ground.

Goats are by nature inclined to ascend: in a wild state all the species reside on the most elevated mountains upon the borders of perpetual snow; and the domesticated, if they live in mountainous countries, will climb invariably, while feeding, till the necessity of drinking, or the habits of education, again call them down. When mixed with sheep they always take the lead, and the more helpless species follows their track. They are fearless, capricious,

impudent, gregarious, not disinclined to associate even with man, but always in motion, ever in search of new objects, persevering yet inconstant. They spring with precision on the most difficult ground, love to look over precipices, and to perch on the highest accessible pinnacles. They walk on narrow ledges of rocks, and if two meet in such a place that neither can turn, one lies down and the other passes over its back*. Their senses are acute; they see to a great distance, and the faculty of smelling is very delicate; but in the choice of food they are not difficult, often preferring bitter plants, *Euphorbia*, *Cicuta*, and even manufactured tobacco, barking the trees and buds, and doing great mischief to the woods. None of the species are large in stature, but their structure is robust, and their habits vigilant. The chase of them is, therefore, both laborious and dangerous; for every strange object is seen at a great distance, and if suspicious, avoided by a retreat, which defies the skill and industry even of the most intrepid hunter, and often causes his life to be sacrificed, by the dangers of the precipices, the ice, or the animal, driven to despair, bolting down upon him, and plunging both headlong into the abyss. The wild species can mount a perpendicular surface, fifteen feet high, at three leaps, or rather three successive bounds of five feet each, if the slightest rugosity will suffer the renewals of ascending force, while the original impulse is still sufficient to retain the given direction. Between two perpendicular rocks, close together, they mount by alternate bounds from one to the other. In cases of fear, their voice is a short sharp whistle, stronger than the Chamois; at other times it is a snort; when threatening, as we have said, a broken spluttering sound; and when young they bleat. The females are

* Mr. Bingley relates an anecdote of the kind, where two goats passed each other in this manner upon the *torus* of the rampart of the Citadel of Plymouth, overhanging the beach, in sight of a number of spectators, some of whom have confirmed the fact to us.

attentive and affectionate to their young, and will defend them against wolves and eagles.

The *Ibex*. (*C. Ibex*.) The Goats are not numerous in species; in Europe the *Ibex* is the most celebrated. It is an animal near five feet long, two feet eight inches in height at the shoulder, with about two inches more at the rump; the horns are flat, sustained by two longitudinal ridges at the sides, traversed by numerous cross ridges or knots, disposed at intervals so as to bear a resemblance, when seen in front, to a segment of a cog-wheel; they are nearly vertical to the plane of the face at their roots, diverging and uniformly falcated backwards, sometimes thirty inches long, dark coloured, and very robust. It is asserted that the transverse knots mark their age. We have sketched the living *Ibex* reported to be in its third year, with only three; one in the second, having two knots, and old adults marked with fifteen or sixteen; but doubt whether these indications are invariable, or perfectly conformable to fact*. In the first years the *Ibex* is of a light ashy-gray colour, deepening to brown as it advances in age, and in the adult varies from a red-brown in summer, to a gray-brown in winter: the hair is never very long or loose; on the face, and along the back, is a line of a dark colour; the internal face of the thighs and buttocks are whitish; the inside of the ears and inferior part of the tail are white; the head under the chin is short, dark-brown, and not very full.

An adult female, which was shot in the mountains of Asturias, in Spain, had horns much resembling those of

* The first was taken at Les Moulins, in the valley of Chamounix, in the presence of several Bouquetain and Chamois hunters, who agreed in stating that the three knots on the animal's horns denoted its third year; and further asserted that its full growth required twelve years! If the specimen was then in its third year, its growth was certainly not more than half completed. It may be, indeed, that the horns grow till the twelfth year.



the male in his third year, but more slender, less curved, and marked with four knots on the anterior side; the forehead, sternum, anterior face of the legs, and the pasterns, were earthy-brown; the neck and back gray-brown, paler beneath. The Ibex ruts in autumn; the male then emitting a most powerful smell, assembles the females, and remains with them till the spring; when the females begin to withdraw into cover, for the purposes of parturition, which takes place in one hundred and sixty days after impregnation, usually in April; the kids following the mother in a few hours after their birth.

The species seems to be confined to the highest mountains of Europe, the Alps, particularly the Rhoetian, and the Pyrenees, with their loftiest branches. They may exist still in those of Candia, Greece, and the Carpathian, but it is doubtful whether the variety noticed by Pallas in the Caucasian range, was decidedly of the same species. They prefer the most elevated ridges, upon and near the verge of perpetual snow, which they invariably seek when pursued. In Savoy and Switzerland they are now rarer than in the Tyrol, and in the Pyrenees they are nearly extinct.

The *Abyssinian Ibex*. (*C. Joela*.*) There are indications that this animal was known and noticed by the ancients, although both Aristotle and Pliny deny the existence of Wild Goats in Africa, as is remarked by Gesner. It appears, also, that the same species resides in the mountains of Arabia, is referred to by Avicenna, and occurs under the name of Jaal, in the book of Job. Our original drawing, compared with the skulls and horns of several specimens in London, shews the African Ibex to be somewhat more elevated on the legs than the European, of a dirty brownish fawn colour, with a short beard, and lengthened hair under the throat down to the breast, and a darkish line on the anterior part of the legs, and along the back

* *by Jala, Chaldæe, by Jaal, Arabic.*

the ears appear shorter, but the horns, of a dirty colour, are superior in length to those of the Ibex, forming a half circle, closer on the forehead, less diverging backwards; they are subtriangular, having a round edge to the front, marked in one pair with twenty-three very elevated cross ridges, extending to near the posterior edge, and rather irregular in their distances, besides these, four others less prominent appear near the base, and from the thirteenth the larger knots are separated by three smaller. This species, we are told, is numerous in the mountains of Abyssinia and of Upper Egypt; it extends, probably, also over the range of Atlas, and may be the Baeden (though, indeed, from the name, we suspect this to refer to *Ovis*,) of the Dsjac range. There is an undescribed head in the Royal College of Surgeons, considered as belonging to *Ægagrus*: it is a younger animal, but, in all probability, of the same species, and similar to one which we compared, and came from Mount Sinai; it differs from the above in the elevated knots being very regularly divided, and numbering only six, though in their length they exceed those of an Ibex of Europe, which have fifteen. If these be of the same species, the community of habitat is established for them to both shores of the Red Sea; and it may be inferred that the *ps Ake* or *Akko* of Deuteronomy, applies to this animal.

The *Caucasian Ibex*. (*C. Caucasica*.) M. F. Cuvier distinguishes this species from *Ægagrus* "by the horns being triangular, the anterior face forming an angle, with ribs or projecting knots." This definition would apply to the Abyssinian; it is therefore necessary to add, that the knots are progressively more distant from each other as they recede from the base, with uniform transverse wrinkles, not so prominent, confused, and crowded, as in the former. M. Guldenstadt first described the species, which he discovered in the northern part of the Caucasian Mountains. In size and proportions it resembles the Ibex of Europe, but is



broader and shorter in the body, dark brown on the superior parts, and white on the inferior: the head is gray, excepting a space round the mouth, which is black; the breast, and a line along the back, are dark, and there is a white streak at the back of the shanks; the under jaw and gullet are generally whitish-gray, and the anterior part of the legs is dark; the horns are about twenty-eight inches long, dark brown, and very solid. The hair of this species is rather hard, more ashy in winter, and at the root interspersed with much grayish under-wool. The females are smaller, with diminished horns, as in the former.

This species of Ibex is equal, if not superior, in strength and agility to the Alpine, making immense bounds with the utmost confidence. Monardes relates that he saw an Ibex leap from the top of a tower, and falling on its horns, immediately spring up and move on without having received the slightest injury. It resides in the Caucasian Mountains about the sources of the Terek and Cuban, and is probably found in the high mountains of eastern Persia.

The *Ægagrus*. (*C. Ægagrus*.) This species is distinguished from the former, by the horns forming an acute angle to the front, with the ribs less broad, assuming an undulating edge, and the posterior part rounded. In size and proportion it is nearly the same as the Ibex; the fur is grayish-brown above, with a dark line on the back, and a black tail; the head black about the nose, rufous at the sides; beard and throat brown; the horns are near three feet long, but in the females they are small, or altogether wanting; their fur is paler and more uniform in colour. Kæmpfer noticed the Bezoar bearing Goat by the name of Paseng, which Buffon, by mistake, transferred to an Oryx; and it is very probable that the Antelopes, as well as other ruminants, occasionally produce these concretions. That the oriental Bezoar was extracted chiefly from the viscera of the present species at a very early period, appears indi-

ated in a bas relief at Chelminar or Persepolis, which represents a man leading a wild goat by the horns, in token of tribute to the great king.

Kæmpfer, Gmelin, and others, notice the *Ægagrus* as found in the Caucasian Mountains, the hills of Laar and Chorazan in Persia, and in still greater abundance in Asia Minor. Pallas first clearly distinguished it from its congeners, and conjectured that the domestic goats might derive from this stock.

It is supposed that a variety inhabits the high mountains of Europe: two individuals existed in Paris, described by the Baron, but with some doubt as to their identity with the Asiatic *Ægagrus*. In general they were of the same form, but the horns had not the anterior edge undulating, but rather level, and marked with transverse striæ, though one shewed eight more prominent ridges; they were two feet six inches long, and the tips somewhat turned outwards; the colour of one was gray, that of the other fulvous. It was also doubted whether these were not the offspring of the *Ibex* and the Common Goat, but this conjecture was the more questionable, because their inter-copulating with the Domestic Goat was either followed by abortion, or by the speedy death of the kid. Large individuals, cherished as leaders of the flocks, are not uncommon both in Switzerland and the Pyrenees. We have even seen sheep of a very large size kept for the same purpose; and at Chamounix, a male goat, which would have answered to the above description, but that it was covered with long hair. This animal was said to be the third remove from the intermixture with the *Ibex*.

If continued experiments on crossing the wild and tame species of the Goat should not reverse the results obtained in Paris, it would follow that the tame species are not descended from them; yet there is a gradation of the character in the horns from the square nodose of the Alpine

Ibex to the more obtuse Caucasian; then the sharper nodose and rugged striæ of the Abyssinian passing to the transversely striated yet undulating sharp edge of *Ægagrus*; from whence the smoother edge of the Alpine *Ægragri* are immediately allied to the common domestic. Among the varieties reared in Bengal, it is, however, common to observe, that the fine breeds originating in the northern provinces, perish when removed towards the south, though still above the Ghauts, and far from the sea. Great alterations in the typical forms must, indeed, be admitted, where many ages, climates, and species of food, and above all the weight of domesticity, has acted so unremittingly, as in this case, and accordingly we find some breeds tall and robust, like the wild, others small. There are races whose bodies are supported on very short legs, some with long, others with short hair, the horns of various sizes and curves, or even totally absent, and the concave chakron changed into an arch; the nose depressed, and the chin prolonged: domesticity has also changed the ears, naturally small and neat, into long and pendulous, to an enormous disproportion, and the colours from the gray and brown, are varied to black, white, spotted, and pied, in every imaginable variety.

The *Domestic Goat* (*C. Hircus*) may be mentioned under its principal varieties, taking for principle that those most resembling the wild species are nearest their original type. These have small upright ears, differing, in general, little from the *Ægagrus*; the male is, however, smaller, more coarsely clad, with horns more vertical, and the ends turning outwards; their colours pass from blackish-brown to sandy, black and white. Further removes from the normal characters have horns more or less diversified, a smooth coat, with white, brown, and reddish colours; then large and pendulous ears, with various hair, and common to all the varieties are small glands hanging beneath the

throat, and the want of horns: a few are policerate, or have a monstrous assemblage of more than two horns. The utility of Goats' milk is well known, and in warm countries the flesh of the kid, especially of the short-haired breeds, is very palatable: the hair and horns are employed in manufactures, and the skin is valued for gloves, morocco leather, and vellum.

The Persian breed retains the form of the horns as in the *Ægagrus*, but on a diminished scale. It has long coarse hair, ashy-brown, with rufous tips, and a large tuft of hair stands forward between the horns like the forelock of a horse; the ears are small and upright. A specimen was brought to England along with the horses presented to the king by the Persian ambassador.

The Welsh breed is of a large description, generally white, with fine long hair; the horns vertical, then bending outwards, sometimes above three feet long; the ears upright.

The Widah or Jueda long-haired breed. Smaller, and in particular lower than the former; the horns depressed, bending outwards and upwards, with long fine hair, often white; ears upright.

The short-horned breed, with smooth hair, more variously coloured; ears upright.

The Dwarf Goat, originally from Guinea, now extremely multiplied in South America and the West Indies; much intermixed with other breeds, and then larger in size, but always distinguishable by close short hair, more or less white, with fawn-colour, and especially in the males, with some parts nearly black, as the beard, tail, neck, and legs: they are usually without horns, and have small upright ears. We have possessed a flock of this variety, among which one had four mammæ. This breed fears thunder, and above all, rain: a slight shower would drive them in an instant, all bleating, under cover.

Sweden and Spain have also long-haired hornless breeds, often white-coloured, with upright ears.

We possess a drawing of an Indian variety, with long curling hair, of a white colour, nearly allied to the Cachemire breed, but retaining small upright ears; the horns are yellowish, and angular, with a triple spiral turn, directed outwards, the female with short curved horns turning downwards, and the face and legs fawn-colour. Can this be the species which Mr. Boyle, in his Embassy to Tayshoo Lama, considered as sheep?

The Cachemire breed resembles the last, but the hair is quite silky, long, straight, and white; the ears large, and turned downwards, brown or blackish; the horns more upright, pale-brown, and not so spiral; the legs slender and clean.

The Thibet, or Tartar half-breed of the above, lately introduced into France, by the judicious patriotism of a private individual, has likewise very fine and white hair, but more subject to black patches. The horns are ash-colour, still less spiral, shewing only one or one and a half turn; the ears smaller, but pendent, and legs robust, with long hair at the back.

The Angora breed, with long soft hair, mostly white, an ovine physiognomy, long buff-coloured ears, and the horns more upright, forming about one turn, and yellowish. In the females turned downwards, and short.

The Policerate breeds, with long hair, mostly white, and smaller drooping ears.

The Syrian long-haired breed, with horns rather erect and bending outwards, slightly spiral, the ears longer than the head, pendent; our specimen black where the hair is long; the head, ears, and legs, white, mottled with black.

The Nepaul breed, high on the legs, the carpus short, the nasal bones elevated, rising the chaffron into a high convexity; the horns short, very spiral, like a screw; the

hair rather long, loose, black, in others slaty-gray; the ears longer than the head, white, speckled with black; the lips, chin, a spot on the forehead, and one on the breast, white.

The Egyptian breeds. One with long hair; horns depressed, sub-spiral; ears small, pendent; colour often brown; a second, with horns very spiral; ears longer than the head; close smooth hair generally brown, and a third breed with the ears very long and broad, one sometimes cut off, to facilitate the animal in feeding, horns small or none, hair rather long, generally rufous-brown.

The breed of Upper Egypt, without horns; chaffron singularly elevated; the nose contracted, so as to shew the chin and incisors bare; high on the legs, with coarse hair of a rufous-brown colour. The females with the udder hanging very low.

The *Jemlah Goat*. (*C. Jemlanica*.) This unquestionable species is only known from the skull and skin formerly in the British Museum. The size of the animal appears nearly equal to the Ibex; the facial line is straight, though the prominences of the horns give the forehead a concave appearance; the eyes are rather small; the ears short, narrow, and rounded at the tips; the horns stand obliquely on the frontals, rather high above the orbits, nearly in contact at base, extremely depressed, almost flat, four inches and a quarter in breadth at the root, nine inches long, inclining outwards, then suddenly tapering into a point which turns inwards, so as to nearly meet over the neck; their colour is pale ashy-buff, the anterior edge marked with seven small protuberances, round, distinct, almost detached; shaped like drops, being gradually obliterated as they ascend, and each marking the commencement of a wrinkle, which passes round the external flattened surfaces, in the form of grooves, resembling the joints of a lobster, and leaving about four inches smooth, where they contract into a point;



THE LAMBERT

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the bones of the head are exceedingly solid and ponderous, without a void space on each side of the nasal bones, as is the case in the Caucasian and *Ægagrus* species. The hair of the face and legs is short, marked with a dark earthy-coloured streak down the chaffron; that of the neck and back is very abundant, long and loose with a streak of the same dark sepia colour down the ridge of the spine; the tail is very short; on the sides of the cheeks, the hair is exceedingly long and coarse, hanging like a lion's mane on each side of the head, and feathering vertically also upon the shoulders; excepting the dark streaks before mentioned, and a darkish line on the anterior part of the legs, the whole animal is of a dirty whitish-fawn, with a few locks of brown interspersed. It has no true beard, and the limbs are remarkably robust.

This species is said to inhabit the district of Jemlah, between the sources of the Sargew and Sampoo; that is the most elevated range of Central Asia, forming the nucleus between the western and south-eastern branches of the Himalayan Mountains. It may therefore represent the Ibex in the most lofty ridges of the East, beyond the Burampooter, and extend into China. The Capricorn of Buffon seems to have been an accidental variety, no satisfactory description being given of the animal. It might have been preferable to transfer that name to the present species, if the species could have been identified. Had the Jemlah and its native regions been known to a celebrated philosopher of France, he would no doubt have adduced it as a new proof in support of his opinion, that the Egyptian Zodiac was originally derived from a nation residing under or near the forty-third degree of north latitude, or in Central Asia, and marked its short horns as the true type of the original Capricorn. At this moment we have a Birman Zodiac, chased in silver before us, where the Capricorn is

actually represented with short horns, so that the conjecture is, even in this instance, not without corroboration.

The drawings of which M. De Blainville makes mention, as representing goats by the names of *Cossus* and *Imberbe*, of which we believe the originals to be in the Museum of the Honourable East India Company, seem to be domesticated varieties of this species.

The *Cossus Goat* (*Chevre Cossus of Blainville*) is entirely white, covered with long hair, not curled; ears horizontal; the horns bent back and outwards at the points; depressed against the posterior part of the head; the forehead prominent; no true beard on the chin; the hair of the face turned to right and left, very long, and dividing the middle line of the chaffron; the tail short, curled up.

The *Beardless Goat* (*Chevre Imberbe of the same author*) greatly resembles the Caucasian Ibex in the general forms. The body is bulky and lengthened; the neck short and wide; the legs rather long and stout; but the head resembles that of a ram; the chaffron is arched; the forehead prominent; the ears horizontal and middle sized: the horns much compressed, transversely wrinkled, nearly in contact at the base, then widening outwards and backwards, and slightly twisted. Those of the female smaller and less compressed; the tail turned up; the hair in general short and close, longer, and forming a kind of mane of a black colour on the neck and part of the back: no beard on the chin, but a pendulous skin in the form of a dewlap; the general colour, variegated black and white, irregularly scattered.

The small species *C. Depressa*, described by Buffon, may also derive from the Jeimlah; the horns being greatly depressed, recumbent on the back of the head, and the hair long. It is doubtful whether Africa be its native country; for the breed propagated chiefly in South America, may

have been introduced from Manilla; at least among the multitude of which we have seen on the eastern coasts of the New World, brought from different parts of Guinea, not one of this variety occurred.

THE GENUS OVIS.

Sheep are so nearly allied to goats, that the distinguishing characters of the two genera are of a trivial nature. The chaffron which in the former is almost invariably more or less elevated, is in the latter occasionally of the same form; the beard is not absolutely wanting in the one, and sometimes absent in the other, and the wool which distinguishes almost all domesticated sheep, in the wild or Argalis, is reduced to a rudimental state, little more prominent than in several species of Antelope, of Deer, and of the Wild Goat itself. It was believed by the ancients, that sheep are an hybrid production,

Tityrus ex ovibus oritur, hircoque parente:

Musimonem Capra ex vervegno semine gignit—

and the moderns still relate that the commixture of the two species produces prolific breeds, said to be common in some parts of Russia, and also found in America, where it is known by the name of Chabin. There are, however, no well authenticated facts to establish the matter beyond a doubt, and the mere carelessness of the proprietors of flocks is certainly insufficient cause for their existence; for if the two genera intermixed with facility, and remained prolific, most countries would be without the pure breed of either, and possess only the intermediate: and above all the west coast of Africa would be in that condition, because the wool is there no object, and not the least care is taken in breeding of the domestic animals; and yet several breeds of goats and sheep exist, perfectly distinct and without the smallest appearance of

having mixed at any former period. The notion of the Chabin may have arisen from the sight of sheep, partly clothed with hair, and partly with wool, a breed not uncommon in Northern and Western Africa, from whence it may have been transported for live stock on board the slave ships to America, and preserved for curiosity or for want of better stock.

If the Caprine genus be endowed with a more indelible impression of its primitive characters, with more confidence and familiarity, a greater spirit of independence, combined with an elasticity of temperament fitted for all climates and soils, so as to render it an earlier associate of man, during the first dawnings of civilization, and cause it to multiply by his care in woods and swamps; the Ovine, though more timid, and when domesticated, more helpless and delicate, must have become the most important acquisition, especially in the colder climates of the earth, as soon as the state of society and of the region would suffer its propagation. At first, no doubt, it was without wool, but certain parts of Asia have a natural tendency to prolong the fur of animals; even of Carnivora and Rodentia. It is there, we might conjecture, that the Wild *Ægagrus* lengthened and refined its short hairy covering into that of great length and the finest texture, and the newly-domesticated *Argali* first put forth the under down of its fur to obliterate the setaceous hair, and assume the fleece. The high western basin of Cantal Konti, or Cachmere, the secondary valleys of ancient Taurus and Caucasus, the Chorassan and Caramania, and at length, the environs of Angora, or central basin of Asia Minor, about the sources of the Halys and Sakaria, may be considered as the favoured nurseries from whence the improved fleece-bearing animals have gradually spread over the rest of the world. It was at the foot of Caucasus that Jason obtained his celebrated spoils.

Although the generic characters are so little remote from *Capra*, that there is less difference between them than between the sub-genera of *Antelope*, still certain physiological traits are always obvious, and lead to other indications of more importance. Among these, the horns are very voluminous, more or less angular, transversely wrinkled, pale, or whitish, turned laterally in spiral directions, and growing upon a porous bony axis; the forehead with its chaffron is almost constantly arched, and protruded before the base of the horns, but there are no lachrymary openings, and the nostrils are lengthened, oblique, and terminated without a muzzle; the incisors, the middlemost of which is the largest, form a regular curve, touching at their sides. Sheep have no beard, properly so called; the ears are middle-sized, and pointed; the body is round, covered with short close hair, with a short downy wool beneath, and the legs are slender and firm, without brushes or callosities. Their stature is rather larger than that of the Ibex, but that of the female does not exceed that of the Goat; her horns are small, pointed, almost vertical, and divergent, sometimes wanting, and there are two mammae. A rufous-dun, passing into a chocolate-gray, appears to be the wild primitive colour of the genus, in which particular all the species have so close a resemblance, that they may be considered as forming only one, slightly diversified by the accidents of climate and food; but with regard to the domestic races, it is varied to excess by all the circumstances which the influence of man can produce.

Sheep live in families or flocks, more or less numerous, upon the most inaccessible mountains of Asia, Africa, Europe, and America; a circumstance sufficient to prove, that in strength, hardihood, and enterprise, they are in nowise inferior to goats. They are found on the Islands in the Mediterranean, and even upon the Kuriles in the Northern Pacific, where it would seem that the ice only could have

brought them ; nor, indeed, can their intellectual qualifications be justly considered as inferior to those of the Caprine genus. We have already alluded to a striking proof of their intelligence in a former part of this work ; and it is equally known that they practise the same expedient for passing each other on a narrow space, as is recorded of the goat. They are certainly timid animals, but this shyness, as in other ruminants, is balanced by curiosity, and when once overcome, tends to extreme confidence. We cannot, therefore, assent to the whole inferences drawn by the acute observer M. F. Cuvier, and by M. Desmarests, from the apparent stupidity of the Mufro allowing itself to be caught as often as was required, by merely offering it bread ; we only see in this fact, that the animal had so far familiarized itself with man as to feel the desire of obtaining a dainty, more than the fear of ill consequences. It is not under the confined circumstances in which this animal was placed, but it is in the country where no direct constraint has cramped their faculties, and above all, in their wild state, that we should study and appreciate their moral qualities. Now if we turn our view to an intermediate state, as, for instance, the Mountain Sheep of Wales, half wild from the nature of the country, we find them not crowded in close herds, because experience has taught them to feel secure from carnivora, but scattered in groups of twelve or fourteen, one of which is, nevertheless, on the look out, from a rock or a peak, to give warning of the approach of any strange object, and to give the hissing signal of retreat, when all betake themselves to the most inaccessible parts of the mountain. Such is also the practice of the American, and no doubt of all the *Argalis*, whence the difficulty of arriving within gun-shot, which is as well known in Kamschatka as among the Cree Indians. If they be shot, it is, in general, because, feeling secure from dogs, they will stop and look with curiosity from some lofty crag upon their cry beneath, while the wary hunter steals unperceived

upon them. Nor are their affections obliterated in a domestic state : he, who in shearing time, when the lambs are put up separately from the ewes, witnesses the correct knowledge these animals have of each other's voices ; the particular bleating of the mother, just escaped from the shears, and the responsive call of the lamb, skipping at the same moment to meet her ; its startled attitude at the first sight of her altered appearance, and the re-assured gambol at her repeated voice and well-known smell ; he who observes them at these moments, will not refuse them as great a share of intelligence as their ancient subjugation, extreme delicacy, and consequent habitual dependance on man, will allow.

The courage of sheep is superior to that of goats. The males both wild and tame alike contend with each other for the possession of the females, by butting with the forehead and horns, running at each other with great force, so as to precipitate the vanquished sometimes over precipices of great height ; and the solidity of their skulls is such, that the domestic ram, whose blows strike low, will drive a bull out of the field. Rams, and even weathers, will attack, and sometimes kill, dogs, or foxes. Instances of this kind are not uncommon in the mountainous parts of England, though they might appear incredible on the Continent, where sheep enjoy less liberty. British shepherds are also well acquainted with the cunning and the arts sheep will put in practice to elude their vigilance when a young corn field entices them to theft ; and the Scottish and western mountaineers often witness their sagacity in anticipating a storm, by seeking timely shelter under a cliff, where sometimes it is necessary to dig them out of the snow, in which they become buried, without incurring any material injury.

Sheep drop the two middle incisors of their first teeth after a twelvemonth's age ; at two years the two next ; at three, four are renewed ; and at four years' of age all are replaced : they are then white and regular, but by degrees

they become blunt, angular, and blackish. The horns of the Ram acquire annually another ring. They suffer from various insects, among which the *Oestrus Ovis* is most detrimental, the larva introducing themselves from the lips into the nostrils, and thence into the frontal and maxillary pores, stopping them up, and causing diseases which often prove fatal. They are, probably, less dangerous to the wild species, who constantly reside in elevated localities. Sheep feed in preference on alpine and aromatic herbs, and are always more choice than goats in the quality of their pasture. It is stated to be a fact, that they will devour greedily several species of *Helix*, which come to the surface of the soil in dry periods*.

The high mountains of Bhootan are frequented by an animal of this genus, which may be a variety of the next species. They are known by the name of Nervati, or Wild Sheep of Bhote, and are represented as similar in colour, and in the texture of the hair, to the Ohiru, that is a slaty bluish-gray, inclining to red, and concealing, beneath the general superficies, a spare fleece of very soft wool, which lies close to their skin. This colour is, probably, not unlike that of the Musmon, or a liver-coloured gray; but it may be that the Nervati is of a different species, and even of a different genus, because we have no account of the horns.

The Asiatic Argali. (Ovis Ammon.) This species, observed and described by Gmelin and Pallas, is perhaps, the Pygargus and Ophion of the ancients. Rubraquis was the first of the moderns, about 1253, who again noticed it by the name of Artak, most likely an erroneous reading of the MS. for Kirtaka, one of its Tataric names: that of Argali, first admitted by Pallas, is the Mongolic for the female, that of the male being properly Guldshah. Several of its Asiatic names have a reference to the white ramp. It also seems

* The species hitherto mentioned are, *H. Ericetosum*, Lin.; *Conitus Muli*; *H. Cingenda*, Zeba, Leach; *H. Cantiana*, Mont. Leach.

to be the ancient German Weissarsch, although this mark is not so distinctly observable in this as in the next species or variety, this circumstance, however, might explain the disputed *דִּשְׁוֹן* *Dishon* * of the Pentateuch, and *πυργγύον* of the LXX. ; it is also more consonant with the interpretation of Bochart.

The male is not much inferior in size to a stag, individuals having been killed that weighed considerably above two hundred pounds. He is about three feet high at the shoulders, and nearly five feet in length. The horns are very large, sometimes near four feet long, and weighing upwards of thirty pounds ; their width is so considerable at the base, that young foxes are said to shelter themselves in such as are found casually on the ground ; they rise near the eyes, before the ears, occupying the greater part of the back of the head, and nearly touching above the forehead, bending at first backwards and downwards, then to the front, and the points finally outwards and upwards ; their base is triangular, with the broadest side towards the forehead ; the surface is wrinkled crossways to beyond their middle, but the extremity is more smooth. Some variation of form occurs in the *Argalis* of Caucasus, their horns being often only semicircular, almost round at the base, extremely heavy and stout, dark brown, with scarce any wrinkles, not tapering, but ending in a stumpy form. The fur of the animal consists of short hair, fulvous-gray in winter, with a ferruginous buff-coloured streak along the back, and a large disk of whitish buff on the buttocks, including the tail ; the internal side of the limbs and the belly are still paler, and the chaffron, nose, and throat, are white. In summer the whole fur is more rufous, but the buff-coloured mark on the buttocks remains unaltered. The female is smaller, with slender horns, nearly straight, and small wrinkles, resembling those of a domestic goat ; the colours of the hair are

* *Dishon*, as derived from *דִּשְׁוֹן* *Dishon*, cinereous colour.

nearly the same, but paler, and without the disk on the buttocks; both have the face rather straight, the tail very short, the eye-lashes whitish, the skin beneath the throat lax, and covered with longer hair, and a close wool concealed by the outer coat.

The Argali inhabits the highest mountains of Central Asia, the Caucasus, Kamschatka, and the elevated steppes and plains of Siberia, &c. The males fight fiercely in the manner of the Common Ram; they breed twice in the year, in spring and autumn, and produce one or two lambs at a birth. These are at first covered with a gray fur, and if taken they are easily domesticated; but the adults remain always intractable. They are strong and active, flying from the least danger, always in a direction of the most inaccessible ground, but their motion is from side to side, like that of the Domestic Sheep, and stopping in their course to look at the pursuer. The flesh is esteemed very savoury, and the skins, now becoming more rare in Russia, fetch a good price on the spot to be converted into articles of clothing. In the autumn, when they descend from the mountains, they are very fat, but in the spring they are lean, from want of choice food, and from licking salt, before they again ascend to the sunny glens of the high mountains.

The American Argali. (O. Pygargus.) This animal was known in the time of Hernandez, by the name of Sheep of California; Venegas and Clavighero, afterwards noticed it, and the Canadian fur traders have long been acquainted with it by the name of Culblane; but Mr. M'Gillivray after his travels in the Rocky Mountains in 1800, first drew the attention of Zoologists more particularly to the species, and its spoils have since been transmitted to Philadelphia and London. In size and form, it resembles the former, being also about three feet high at the shoulder, and four feet six inches in length, but the horns are still larger and more perfectly spiral, measuring above fifteen inches each at their



AMERICAN ARGALI

Ovis MONTANUS.

18

A. B. S. P. del. lith. by J. H. B. S. P.
Philadelphina.

London: Published by J. H. B. S. P. March 1847.

base, and the pair covering the sides of the head from near the eyes to the occiput, touching at the top of the forehead. This structure lengthens the head, raising the forehead high between them, and depressing its articulation below the orbits; their triangular characters is almost effaced by the arching of the sides. In old specimens the wrinkles are not very prominent, and the tips are commonly broken off. The face and mouth is white; the cheeks, neck, back, and limbs, dun rufous-gray; the tail, about five inches long, together with the buttocks and part of the croup, is enclosed in a disk of whitish-buff; the eyes are pale bluish-gray, and there is no appearance of a lax skin or longer hair beneath the throat. The females are smaller, and have similar horns to those of Asia.

In their manners they resemble the *O. Ammon*, living in troops of thirty to forty, headed by an old ram, bounding vigorously along the steepest ridges, and occasionally descending on the plain, particularly during the severest winter days. If the American species be the same as the Asiatic, which appears very probable, it can have reached the New World only over the ice by Behring's Straits; and the passage may be conjectured as comparatively of a recent date, since the Argali has not spread eastward beyond the Rocky Mountains, nor to the south, further than California.

The *Bearded Argali*. (*O. Tragelaphus*.) Africa has its Argali, and in all likelihood more than one variety of the species; for it does not appear that the specimen described by Dr. Caius, and that discovered by M. Geoffroy St. Hilaire in the mountains of Egypt, can be viewed otherwise than as varieties of the same species; that figured by Mr. Pennant may be altogether distinct.

The *Tragelaphus*, described by Caius about 1561, brought from the mountains of Mauritania, Morocco? was larger than a fallow-deer, or nearly equal to a stag, being three feet six inches at the shoulder, and four feet six

from the nape of the neck to the tail. The head, from the nostrils to the vertex, one foot three inches; the horns one foot one inch and a half in circumference at base, one inch asunder on the head, bending back and downwards, angular, black, two feet one inch long and wrinkled; the ears small; a beard formed by hairs on the cheeks, and under-jaw dividing into two lobes; the neck thick, of no great length, and beneath it a quantity of long hairs hanging from the throat to the knees; a setaceous mane stood up along the neck, and in particular about the withers where it was tufted, long, and erect, and of the same colour, or somewhat darker than that of the rest of the body, which resembles the winter dress of a stag, or blackish-rufous; the knees, protected by long and dense hairs which seem intended to protect them in bounding, were bent backwards, but without a callosity; the legs were slender, and the external hoofs of the fore-feet longer than the internal; the incisors were only *six* in number; the nostrils black, divided by a perpendicular line of the same colour. It was gentle, petulant, and lascivious, fond of ascending high places and roofs of houses; it could run swiftly and bound prodigiously. According to Caius the females are larger than the males, but are not provided with a similar luxuriant mane, but on this head he does not seem to speak from personal observation. This animal appears to be the real Fishtall or Lerwee of Shaw, all the characters agreeing excepting the stature, which may have been over-rated to him by the Arabs, or may allude to some of the smaller breeds of cattle, whose heifers in Africa are not higher at the shoulder than the male is here represented. Its character is likewise in harmony with the name, whether the interpretation of Fishtall refer to its form, or to its habits*. Here we

* According to my learned friend, N. Howard, Esq., the name may be a compound of *فش* *fesh*, bristles, mane, and *تال* *tall*, long; thus *long mane*; or be compounded of *وخش* *vehsh*, a desert, and

have the true name, by which this species should be designated from that of *Tragelaphus*, adopted by Caius and Gesner, because Pliny noticed an animal with a forked beard, residing on the banks of the Phasis in Asia, as evidently intended for the *Ægagrus*, or the Caucasian Ibex.

M. Geoffroy St. Hilaire, described and figured * a wild sheep of the mountains of Egypt, which has great affinity to this, and may be a variety, or perhaps merely differing from youth. It is not larger than a common ram; the horns are only eleven inches in circumference, and the throat, not the under-jaw, is lined with long pendulous hairs, but there is no mane on the neck, nor tufts upon the shoulders; the knees, as in the former, are protected by a kind of ruffles, consisting of straight hairs about five inches long, hanging quite round them; the tail is longer, or nearly six inches; the colour pale rufous, and the hoofs as in the Argali. It was discovered in the mountains of Egypt.

The figure published by Mr. Pennant is a copy from a print by Bassau, after a drawing of Oudry, representing a species of Argali which belonged to the Menagerie of the King of France; this must have lived some time in captivity as appears by the great length of the hoofs, which invariably assume an unnatural appearance, when these animals are long confined. The general aspect of the specimen is not unlike the former, but the horns, placed at a considerable distance from each other on the head, are smaller at base, forming a curve indeed, as in the Argali, but the points turning more directly and irregularly outwards. There is a considerable undivided beard under the throat, but no

♂ *tall*, wanderer, or the desert wanderer; *vehsh* signifies also, *animal silvestre fera*, a wandering wild animal.

* In the great work on Egypt, by the Institute of Cairo, it is there named *Moufflon d'Afrique*. We found the specimen in the Museum of Paris.

tufts of long hair about the knees, nor mane on the neck. It may be an individual of mixed blood, such as the ancients often allude to; perhaps the Ophion of Pliny.

The *Musmon*. (*O. Musmon*) The ancients were acquainted with this animal: Pliny notices the *Musmon*, *Musimon* and *Ophion*. In Candia it is still said to be found. The mountaineers of Sardinia and Corsica are well acquainted with it, by the name of *Mufro*, and in former ages it abounded in Spain, and, probably, in all the high primitive chains of mountains in temperate Europe. If one species of *Ovis* can make a direct claim to the progenitorship of the domestic breeds more than another, it would be the *Musmon*, and the last described variety of Africa, which by the structure of its horns is more allied to *Musmon* than to *Ammon*; both having proved that the intermixture with domestic sheep is readily accomplished, and the intermediate breed prolific. It is probable that African sheep first peopled the south and west of Europe, perhaps as early as the Asiatic, which may have spread themselves over Greece, Sicily, and the east of Italy; but a later period may be assigned to those which came round the Black Sea into the valley of the Danube: the northern nations of wooded Europe, could not maintain them till a period comparatively recent.

The Corsican *Musmon*, like the African animal, has the horns shorter than the other *Argalis*, usually not exceeding one and a half the length of the head, curved backwards, and the points turned inwards. In general the colour of the fur is a brownish or liver-coloured gray, with more or less white upon the face and legs; there is also a tuft of long hair beneath the throat, and a darker streak along the back and on the flanks. But they sometimes vary in colour, being marked with large black spaces, particularly about the neck, resembling, in this particular, the domestic breeds both in Africa and India, which appear to be nearest the

original stock. The females are in general without horns, and of all the wild species of sheep they have the chaffron most arched, and are said to be the least intelligent and hardy. This form of the nasal bones is found to increase with the degeneracy of the domestic breed of both goats and sheep, and is even an unfavourable character in the Horse; and we might be led to suspect that the Mufro of Corsica is not a genuine wild animal, but an African domestic breed once imported, and only partially restored to its primitive characters, by the security of its insular situation from carnivorous animals, after it had escaped to the rocks from the influence of man. Columella, who in the reign of Claudius, crossed the breed of his Tarentine sheep with wild rams brought to Gades from Africa, and which were of a *singular* colour, would not have looked for the African, if the Musmon of Spain, then abundant upon all the mountains of the Peninsula, had been viewed by him as the same animal; nor could the Argalis of Africa which are at present known, be the kind mentioned, for *their rufous* colour is not singular, but very common in Barbary. Yet this extraordinary colour remained for successive generations, though the hair was replaced by wool; and we find that the Morocco sheep are very generally marked with spaces of chocolate or liver-coloured brown: that these races have also an arched chaffron, long legs, more or less hair among their fleeces, and the points of the horns turned inwards. The Musmons are distinguished, it is true, by a very short tail, and by the black colour of the mouth and tongue; but the variations in the tail are common among the different domestic breeds, and partially black mouths are not more rare, than a similar distinction in certain breeds of terrier dogs. Of the facility of breeding this species with our domestic sheep, proof was obtained from the specimen brought to England by the celebrated Pascal Paoli, which was the parent of a mixed progeny here; hence, there is some ground

to suspect that the Musmon and Ophion of the ancients were not synonymous names for the same animal, and that the Wild Sheep of Spain and the Carpathian Mountains are not the Mufro of Corsica. The Spanish Wild Sheep mixed however with the domestic, and the intermediate breed, according to Pliny, were named Umbri.

The Musmons of Sardinia and Corsica never quit the highest ridges: where, however, the temperature allows no permanent snows. They live in small herds, headed by an old male, uniting occasionally into flocks of near one hundred; but they separate again in December and January, when the rutting season commences, and the usual battles have decided how many females each male can retain. The females yearn two lambs in April and May, which run about the moment they are dropped, and are cherished and defended with great constancy by their dams: they are not adult till the third year, but the power of procreation is the same as in the domestic races, and can commence at eighteen months. In Corsica the male is denominated Mufro, and the female Mufra, from which Buffon has formed the word Moufflon. Their skins are used for various purposes, and in that island and Sardinia, the mountaineers still convert them into vests, and a kind of cloaks, which may be the present representatives of the *Mastruca Sardorum*, noticed in the commentaries on Cicero, as made from the skin of the Mufro: this dress was worn in particular by the inland robbers, the *Mastruci Latrunculi*.

It appears that in ancient times a wild species of sheep inhabited Great Britain. Boetius mentions a wild breed in St. Kilda, larger than the biggest goat, with tails hanging to the ground, and horns longer and as bulky as those of an ox. Mr. Pennant observes upon this subject, that such an animal is figured on a bas relief taken out of the wall of Antoninus near Glasgow.

The *Domestic Sheep*. (*O. Aries*.) Whether the infinite

variety in the breeds of sheep result from one or more species of Wild Argalis and Musmons, or whether the original stock is lost, are questions which appear in a great measure determined by the observations made on them in the preceding pages; but it may be worth observing, that as Asia seems to exhibit the most numerous and finest varieties in the breeds of domestic goats, so Africa might claim the greatest number of distinct varieties of sheep, from those approaching nearest to their supposed primitive characters, to the ultimate degree of deterioration which can exist without extinction. The gradations in the scale of domestication, appear to be distinguishable in the first place, by a decrease of bulk in the horns, retaining the original direction, or passing into more elongated spiral turns; by a partial retention of hair on the body, more or less mixed with wool; by the local accumulation of fat on certain parts; by the expansion and drooping of the ears; the lengthening of the tail; by the arching of the nasal bones or chaffron; and last, by the wool changing from white to dark brown and black. In proportion as one or more of these characters combined are observed, the breed recedes from the original type; but in reviewing the races by these indications, regard must still be had to the obvious influences of climate and circumstances.

The principal breeds of Africa are the *Adimain*, or *Long-legged* Sheep, remarkable for elevated legs and robust make, notwithstanding they have hollow flanks. In height at the shoulder, the ram measures three feet, and in length exceeds four feet six inches. The chaffron is more or less arched, the ears horizontal, the tail invariably very long, and the neck short. On the croup, back, and flanks, there is wool, varying in the degrees of fineness; but from the nape of the neck to the shoulders, a heavy mane of hair hangs down to the breast. The horns in general are short, form-

ing a segment of a circle round the ears. Of this race there are several subordinate breeds, the first, or

Morocco breed, has long wool; the hair on the neck rather shorter and more undulating, of a rufous-brown; the ears small, horizontal; the horns small, turning spirally outwards, and the scrotum forming two separate sacks: general colour white, with some marks of liver-colour. A specimen sent by one of the princes of Morocco, was in the possession of Sir J. Banks.

The *Emmema* or *Guinea breed* is the second, and well known by the figures of Maregrave, Buffon, and M. F. Cuvier. The horns of this animal form a semicircle, with the points forwards, rather robust and short. The females are hornless. There is usually some black distributed about the sides of the head and on the neck; and in proportion as this colour spreads on the specimens we have seen, the horns were observed to decrease in size, the ears to become more pendulous, and at last wattles were found near the throat. Of this sort was a large ram from Guinea, nearly without wool, white in colour, but with large black spots on the head, shoulders, flanks, and legs; on the neck there was a beautiful mane of long silky white hairs. It is this breed which was formerly introduced into Holland, and kept upon the Islands near the Texel, and in Groningen, by means of which the cross breed with long legs and long wool was reared, which bred twice a year. It is also found, with little variation, in the Fezzan.

The *Congo* is a third breed of the above race, with similar proportions, but still hollower flanks, very arched chafron, meagre and powerless, and instead of wool, covered with loose hair, slightly lengthened beneath the throat; the horns very short, turned back upon the neck; the ears pendulous, two wattles beneath the throat; the tail very long, slender, and almost naked. The females without

horns; and the general colours of the fur consisting in large clouds of pale rufous-brown upon white.

The *Muana Conquo*, *Coquo*, and *Zomba*, Angola breeds, are better proportioned. The form of the chaffron is as in the breeds of Europe; the horns small; in the first and third turning from the head; in the *Coquo* forming a commencement of the usual curve. This species has also more and finer wool, and, in general, bears a black spot round the eyes; the others are more hairy: all have the tail very long, the ears only horizontal, and their general colour is white, with broad spots of rufous.

The *Zumu* or *Goitered breed*, is a fourth of the Angola race, low on the legs, with close hair, pendulous ears, and tail reaching to the fetlocks. It is very delicate, and has the singular peculiarity of a mass of fat rising in the form of a high collar behind the horns, and resting upon the occiput; the horns are very short, slender, turned inwards towards the forehead: upon the larynx another mass of fat hangs like a goitre under the throat; the forehead is so prominent that a deep depression occurs between the eyes; the ears, neck, body, and superior part of the tail, are pale brown; the head, goitre, throat, legs, belly, and inferior half of the tail, white*.

At the Cape of Good Hope several breeds are found, the Dutch imported from Holland, the Indian from Ceylon, and the Indigenous, or *Hottentot Broad-tailed Sheep*. Besides these, other intermediate sorts have arisen by crossing between them; but the Broad-tailed, or *Hottentot Sheep*, is the true South African, and now found also in Madras and Bengal.

It is beneath the ordinary size. The males generally, the

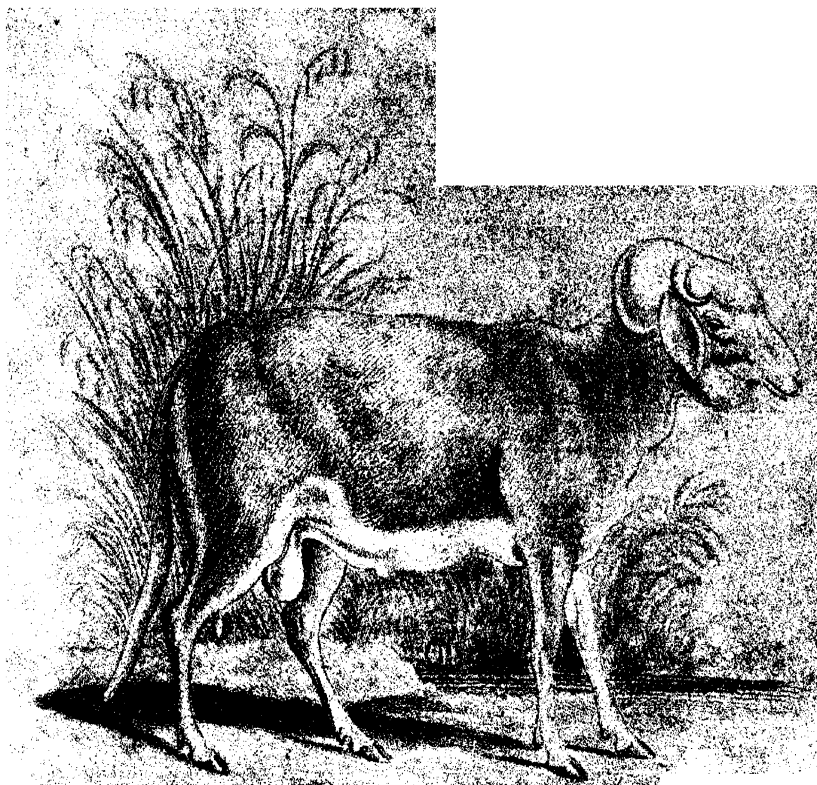
* There are excellent figures of these breeds in the celebrated collection of Prince Maurice of Nassau, the copies of which were immediately recognised by several of our late voyagers on the West Coast of Africa.

females always, without horns, handsomely made, the tail lower than the houghs, ending in a sharp point, the end of which is turned up, with a considerable expanse of fat beneath, rather thick, and not spread laterally; the wool is replaced by very soft and short white hair, with a fulvous spot round each eye; the same on the tips of the ears, the knees, fetlocks, and houghs. It is a very delicate breed, and almost useless if taken on board for sea-stock, wasting and perishing in the first gale of wind. This breed is one of a vast race, spreading, with various modifications, over Egypt, Barbary, the Levant, India, China, and Russia. Their name of Broad-tailed, common to the whole race, is derived from one or two masses of fat extending, with some variation of shape, on each side of the inferior part of the tail where it is invariably naked and flesh-coloured.

Mr. Pennant mentions a second breed of this race also from South Africa, with large pendulous ears, a convex face, small horns, and a long tail. There is a third, which may be a cross with the Dutch. The chaffron is nearly straight, the ears small, horizontal; horns rather large, stretching at right angles from the head. It is a large variety; the head commonly black; the ears white; the wool on the forehead and body, mostly white and coarse; the tail broad, with two lobes of fat at the sides, reaching to the houghs.

The *Barbary* and *Egyptian Broad-tailed* breed is more rufous on the neck, legs, tail, ears, and nose; the wool is coarse, the face not much arched, the ears pendulous, and the horns retain the original curve of the *Argalis* on a smaller scale. In this breed the tail is long, and at base wider than the buttocks.

The last African race we shall notice, is found in Barbary, and even in Corsica. It is policerate, with pendulous ears; the tail not much widened, white in colour; posterior



MONTAN GOAT OVIS MONTANUS

OVIS MONTANUS L. H. MONTANUS

C. Reuther del. L. J. del.

Edinburgh.

parts covered with wool; and from the head to the shoulders with loose soft hair. A crossed breed of this race with the Emmemas, and brought from Guinea, was in the possession of R. Wilding, Esq. It was entirely covered with soft silky hair, of a silvery whiteness; on the fore and hind part of the neck the hair was of great length, especially in front; half of the nose was jetty black; on each knee and on each thigh a black spot; the fetlocks and feet white. In the month of November it began to assume a soft woolly coat, like that of English Sheep, so forcibly was it influenced by the climate. It was at first very gentle, attending its master in his walks, and leaping over the styles in the path; but being introduced to other sheep, it became vicious, and was sent to a mountain enclosure, where it died.

The Asiatic Sheep are partly of the same broad-tailed race as the African.

Pallas mentions one with very few caudal vertebrae, but loaded on each side with a considerable and rounded mass of fat, separated beneath, but uniting at the tail. It has coarse wool, is often dark-coloured, almost black; the hoofs are long, and the ears pendulous. This breed is found in China, Persia, and Southern Russia.

The celebrated *Astracan* breed, which extends over Chozazan, about Meschet, and in the Kerman or ancient Carmania, is remarkable for the fine spirally-curved wool of a gray or mixed black and white colour which is obtained from it. The Sheep are below the ordinary size; the horns of the Ram curved back and spiral at the tip; the ears pendulous; the colour dirty-white, with a fine gray wool beneath; the tail not very broad. The fine furs are of the lambs slain with the dam a few days before yearning. Some are black.

There is another Russian breed without horns: the chafron not much arched; having wattles under the throat; ears pointing downwards and forwards; a yellow face,

and a very short broad tail: the wool is white, and of good quality.

The last Broad-tailed breed of Northern and Middle Asia, is pollicrate, with the ears pointing forward and down, as in the former. The horns are four, five, and even six; the chaffron very convex; wattles under the throat, and very coarse wool. This breed forms the flocks of the Kirguise, and range along the banks of the Volga and Jennissai.

The *Statopyga* or *Fat-rumped Sheep*, are of another race, principally reared in Southern Tartary. They have small or no horns; the chaffron not quite straight; the mouth small and pointed; long pendulous ears, and the tail very short and without fat; some have wattles: the wool is of good quality, but mixed colours, being white and roan or light-brown in the Rams, and black and white in the Ewes.

A variety of this, seemingly crossed with the Astracan, forms a breed in the *Mysore*. It is hornless, with narrow pendulous ears; a very short clean tail, and the wool, very fine, is particularly curled in small meshes, shaped like a cork-screw; the eyes are blue, and the colour pure white. It is the most beautiful breed of India. The late Sir Joseph Banks had a specimen which came from the gardens of Tippoo Sultan, at Seringapatam.

India and China are, besides, in possession of a breed which seems allied to the African Adimain race. It is rather high on the legs, with middle-sized curved horns, a collar of hair reaching to the shoulders, which, together with the head and legs, is deep rufous-brown. On the body there is a short whitish and coarse wool, rather curling, and the tail, more hairy, reaches below the houghs, and is rufous.

The *Dolichura*, or Circassian breed, has a very long tail, trailing to the ground; middle-sized horns, twisting spirally from the side of the head, and very coarse wool, often black.

Among the European varieties

The *Many-horned of Iceland*, seems to be derived from the Russian policerate breed. They are small, with very irregular horns, three, four, or five, in number, never spiral, but variously bent. They have a covering of long coarse hair, beneath which lies a coarse thick wool, and next to the skin a finer down. Their colour is rusty-brown; the legs very small, and the hoofs narrow, long, and irregular, seem to acquire this form from their continual residence upon snow, which does not wear them down. Some of these sheep are housed in winter, but others are nearly wild, shifting for themselves, and often buried under the snow for many days. Yet a good ewe yields from two to six quarts of milk per day, from which butter and cheese is made. They are not shorn, the fleece coming off at once, when the young wool is somewhat advanced (about the month of May).

There is, besides, in Iceland, a large white breed, with similar horns as the former, but probably obtained by crossing with some continental race.

In Corsica the white policerate race, with coarse straight wool and small ears, seems derived from the Barbary breed.

A second race of Europe, with horns of a peculiar character, so as to have been regarded as forming a distinct species, and named *Strepsiceros* by the moderns, is the *Cretan*. The animals are of handsome form, with long horns, having a strong ridge in the front; the Ram is distinguished by having them usually in the form of a complete spiral circle at the base, and then three additional spiral twists ascending vertically; the ears are small, drooping; the tail long; and the whole body covered with undulating wool, of rather a coarse quality; the face and legs are often speckled, or even entirely black. In the females the horns are divergent, straight, and twisted into

four turns on their own axis. Their colour is white, and stature equal to the Common Sheep.

The *Wallachian* breed is derived from the Cretan, and resembles the old unimproved breed of England in form, shape of the ears, and voluminous scrotum, but the wool, though curling, is rather coarse, and straight on the thighs and tail; the horns are very long, marked with a prominent ridge, diverging almost at right angles from the head, and twisted, in a lax spiral form, into two turns and a half. The breed is white.

But the most important continental race of Europe is the *Merino*. It is distinguished from British Sheep by bearing wool on the forehead and cheeks; the horns of the Ram are ponderous, the spiral curve, as in the Argali, turning forwards and laterally into an additional crook; the head is large; the body rounded; the chaffron not much raised. There is a lax skin beneath the throat, which is, in Spain, esteemed a mark, denoting a tendency to fine wool and a heavy fleece: the females are without horns. This race produces the wool of first quality for manufactures; it is abundant, very fine, soft to the touch, much packed, and twisted into the form of screws; oily, but shorter than in the Common Sheep. The race, subdivided into breeds, is extended over the greater part of Spain; large flocks are kept constantly travelling during the seasonable part of the year, and pent up during the winter. The best breeds are those of Cavagne and Negrate; these are kept in pens during the cold season, about Merida in Estremadura, on the left of the Guadiana, and from thence they move about the 15th of April, in flocks of two or three thousand, passing the Tagus at Almaraz, proceeding towards Villa Costin, Alfaro, and Espinas, to be shorn; after which operation they travel again towards the kingdom of Leon, where they are divided into flocks of five hundred head, and distributed on the grazing territory of Cervera, near Aquilos del

Campo. The Souan breed resides in winter on the borders of Estremadura, Andalusia, and New Castille. They remove at the end of April cross the Tagus at Talavera de la Reyna, and at Puente del Arzobispo, direct their march towards Madrid, and from thence to Soria, where a part remains in the mountains, and the rest cross the Ebro to graze in Navarre and the Pyrenees. These three breeds are known by the epithet of Transhumante, or travelling, to distinguish them from the Estantes, or such as do not migrate. Of these latter the best breeds reside about the flanks of the Guadarama and Somosierra ranges, and in the environs of Segovia, where they are shorn in places named Esquileos; but the Leonese breed has the finest form, and produces the most abundant fleeces.

The fleece of Merinos weighs, upon an average, from three to five pounds. In colour, the best are on the surface dark-brown, almost black, from the dust adhering to the greasy character of the pile; beneath, it is pure white, producing a striking contrast with the rosy hue of the skin; the harder the fleece, and the more it resists pressure, the more close and fine will be the wool. Since His late Majesty spread his fine flock of Merinos over England, the breed is much intermixed, and with the Ryeland, by late experiments, four, or at most five times crossed, it has produced wool of equal excellence, and more than double the weight: one instance is recorded of a ram producing a fleece of twelve pounds.

Great Britain, however, produces the most valuable sheep, taking all the qualities required into consideration. From the reign of Edward I. the wool produced was an article of immense value to the kingdom; and from Edward III. to Henry VII. the wool staple was an object of repeated legislative attention. It is curious that in earlier periods the English breed was transported to Spain*, and that from

* Baker says " King Edward IV. enters into a league with John, King of Arragon, to whom he sent a score of Cotsal Ewes and five Rams, a small present in shew, but great in the event; for it

the middle of the fourteenth century the government constantly endeavoured to introduce the manufacturers of woollens into this realm ; and that the gradual success of these measures was chiefly owing to the turbulence of the weavers, and afterwards to the religious wars of the Netherlands, which brought them partly as exiles, partly as emigrants, to the British shores. The value of wool, exported in the reign of Edward III., amounted to 150,000*l.* per annum ; at present the annual value of wool shorn in England, and no longer exported, is estimated at 5,000,000*l.* sterling, which, together with about 600,000*l.* of Spanish wool and some Saxon imported, is worth above 20,000,000*l.* per annum.

No history, ancient or modern, shews an equal instance of such persevering attention bestowed upon improving the breeds of domestic animals in general, and of sheep in particular, as Great Britain presents. The affluent leisure of the great, emulating the practical science of the farmer, is alike engaged in a pursuit, which the Sovereign himself has not disdained to support, and science has forwarded with all its means. When the attention of an enlightened and powerful nation is thus concentrated upon objects of real and practical utility, the result is invariably commensurate with the effort ; and hence, not only horses and oxen, but sheep, and even swine, have arrived at a very high standard of improvement, some, perhaps, at the highest attainable consistent with the climate and circumstances of the case. With regard to sheep, it appears that the chief aim of improvement consists in combining the production of the best wool with the most delicate flesh, upon the least possible quantity of bone, at the smallest expense, and without injuring the vigour and hardiness of the animal. Experience proves that these objects are not effected but by selecting, proved of more benefit to Spain, and more detriment to England, than could at first have been imagined." *Chron.* fol. 206. This must have been about 1466.

at all times, for breeding, the individuals possessed of the handsomest proportions, and crossing them successively with those who partake in the highest degree of one or more of the desired qualifications. When, by these means, a breed is advanced to the point of perfection desired, to desist from crossing, and to breed with the most perfect of both sexes of the same race, or what is termed in and in.

But the nature of the soil, wooded or open, heath or down, elevated or low, the vicinity of the capital or of large cities, demand modifications; for, where the flesh is more valuable than the wool, the chief attention is necessarily bestowed upon that quality, and the greater or less readiness in fattening, preferably to that of fleece. In like manner the difference of latitude and the prevalence of moist weather require modifications; but by the application of these general principles, subordinate to local circumstances, Great Britain has acquired a variety of breeds, each adapted to its localities, in such a state of perfection, that little can be desired beyond the further extension of the practice to every part of the United Kingdoms.

These results were not, however, obtained, but by slow degrees, great expense, and persevering attention. It is nearly seventy years since the system commenced, and its increasing importance may be traced by the comparative prices paid for the hire of rams for the season, and the rate of purchase for those possessed of prime qualifications. At that period, the best rams of the Leicester breed were let out for hire by the season at sixteen and seventeen shillings a piece; and from that time the price kept rising from one guinea to ten, and even more. For the purchase of rams four hundred guineas have been repeatedly given; and Mr. Bewick states, that Mr. Bakewell, in the year 1789, made twelve hundred guineas by three rams, two thousand guineas of seven, and three thousand guineas of the remainder of his stock of rams. But it must be observed

that these enormous prices were paid by the principal breeders, for the purpose of improving their own stock.

The British Sheep may be considered as forming two combined races, collectively distinguishable from others by a very small delicately-formed head, the chaffron not much arched; those derived from the original or old breed with horns, the others mostly without. The line of the back is in general straight, the quarters full, the ears small, the legs slender, the tail rather long, and the scrotum voluminous. According to Mr. Culley there are fourteen different breeds of sheep in the kingdom, all of them sufficiently distinguished by their horns, or by being hornless; by the colour of their faces and legs, and by the length and quality of their wool. To these Mr. Dickson adds two more breeds; and Mr. Parkinson enumerates no less than thirty-seven, to each of which are assigned one or more characteristic peculiarities.

Mr. Culley thus describes the best form of a ram. "His head should be fine and small; his nostrils wide and expanded; his eyes prominent and rather bold and daring; ears thin; his collar full from his breast and shoulders, but tapering gradually all the way to where the head and neck join, which should be very fine and graceful, being perfectly free from any coarse leather hanging down; the shoulders broad and full, which must, at the same time, join so easy to the collar forward, and chine backward, as to leave not the least hollow in either place; the mutton upon his arm or fore-thigh must come quite to the knee; his legs upright, with a clear fine bone, being equally clear from superfluous skin and coarse hairy wool, from the knee and hough downwards; the breast broad and well forward, which will keep his fore-legs at a proper wideness; his girth or chest full and deep; and, instead of a hollow behind the shoulders, that part, by some called the fore-flank, should be quite full; the back and loins broad, flat, and

straight, from which the ribs must rise with a fine circular arch; his belly straight; the quarters long and full, with the mutton quite down to the hough, which should neither stand in nor out; his twist deep, wide, and full, which, with the broad breast, will keep his fore-legs open and upright; the whole body covered with thin pelt, and that with fine bright soft wool. The nearer any breed of sheep come up to the above description, the more they approach towards excellence of form."

In the *Ancient race* or *Black-faced heath breed*, the Rams have horns more contorted than the *Mérinos*. The female is with or without horns. The face and legs are black, or spotted with black; the tail very long, and they have a coarse shaggy wool extended over the forehead and nether jaw; their eyes have a fiery wild aspect; they run with great facility among the heathy mountains, and their flesh is peculiarly fine and high-flavoured. This race, usually termed *Short Sheep*, though now greatly absorbed in the following, still exists in the north-west of Yorkshire, as far as Fort William in Scotland, in Northumberland, and Westmoreland; but the improving system extending over this breed a more elegant form, more slender limbs, and very fine wool, has been obtained, without impairing their hardihood, or the quality of the mutton. They carry from three to four pounds of wool.

The *Norfolk Sheep* retain, in their large spiral horns and black faces, the marks of originating from the heath; they have long dark or gray legs, and large bones; the carcass is long, small, thin, and weak; the wool is short and fine, from one and three-quarters to two pounds per fleece. This breed has a voracious appetite, and a restless disposition; they are good travellers, but not so valuable as others. Norfolk and Suffolk rear them.

The next is the *Dorset*, probably also derived from the ancient stock, without the black colour on the face and

limbs, but horned like the former, and usually in both sexes. They stand rather high upon small legs, and are long and thin in the carcass; the wool is fine and short, from three to four pounds per fleece. This breed has the peculiar property of producing lambs at almost any period of the year, even so early as September and October. They are particularly valued for supplying London, and other markets, with house lamb, which is brought to market by Christmas, or sooner.

The *Wiltshire* is a variety of this breed, which, by attention to size, have considerably more weight. In general they have no wool on their bellies, which gives them an uncouth appearance. Varieties of this breed are spread through many of the southern and western counties; Gloucestershire, Worcestershire, Hereford, &c.

The *Herefordshire* have horns common to both sexes, and rather bulky in the males; it is a fine proportioned variety, with short tails. In Devonshire there is a small breed with horns and long wool, named the *Exmoor*, from the place where they are chiefly bred; these have white faces and legs, delicate bone, neck, and head, but the carcass is narrow and flat-sided. The fleece weighs from four to five pounds.

In the north of Scotland and the Isles are several varieties of a horned small race, said to have been once imported from Denmark or Norway, and having some affinity to the Astracan Sheep. They are named in general *Dun-faced Sheep*. In Kinkardineshire, &c., the breed of this race is distinguished by the yellow colour of the face and legs, and by the dishevelled texture of the fleece, which consists in part of coarse, and in part of remarkably fine, wool, and the mutton is very highly flavoured and delicate; but other breeds intermixed with it, or introduced, gradually obliterate it; and the same occurs in Zetland, where another breed of this race is gradually disappearing.

This *Zelland* breed, and another variety in the same islands, "carry a very fine wool in three different successions yearly; two of which resemble long hair more than wool, named *Fors* and *Scudda*. When the wool begins to loosen in the roots, which generally happens about February, the hairs or *scudda* spring up, and then the wool is carefully plucked off; these hairs remain firm, until the new wool grows up about a quarter of an inch in length, then they gradually wear off, and the new fleece has acquired about two months growth. The new hairs, termed *Fors*, spring up, and keep root until the proper season for pulling it arrives, when it is plucked off along with the wool, and separated from it at dressing the fleece, by an operation termed *Forsing*. The *Scudda* remains upon the animal as if it were a thick coat, a fence against the inclemency of the season, which provident nature has furnished for supplying the wants of the fleece. The wool is of various colours; the silver-gray is thought to be finest; but the black, the white, the *mourat*, or brown, is very little inferior, though the pure white is certainly the most valuable for all the finer purposes in which combing wool can be used."

The *Hebridean* Sheep is the smallest animal of the kind. It has usually straight short horns, a thin lank shape: the face and legs are white; the tail very short; the wool of various colours. Bluish and gray-brown, or deep russet, sometimes meet in the fleece of one animal. It rarely exceeds one pound weight per fleece, though in good pastures it is fine. This breed is likely to be speedily extirpated.

Among the hornless race of England, the *Lincoln* breed, with long wool, has the face white, the carcass long and thin; thick rough white legs; the bones large, the pelts thick, and the wool from ten to eighteen inches long, weighing from eight to fourteen pounds per fleece, and covering a slow feeding coarse-grained carcass of mutton.

This breed will not fatten young, excepting on rich lands, such as Romney Marsh, and the Lincolnshire marshes; yet the great weight of wool amply repays the tedious course of fattening, though it requires two years, which is one more than is required for others.

The *Teeswater* have the wool shorter and lighter than the former; the legs are longer, and the carcass thicker, firmer, and broader; whence it affords finer grained flesh with more weight. It is derived originally from the Lincoln.

The *Dishley*, or New Leicester, is distinguished from other long-woolled breeds by their clean heads, straight, broad, flat backs, round barrelled bodies, very fine small bones, thin pelts, and readiness to fatten at an early age. The mutton is not only fat, but also fine grained, and of superior flavour to all other large long-woolled sheep. The weight of wool is from six to eight pounds a fleece.

The *Devonshire Nots* form a fourth breed of long-woolled sheep, having white faces and legs, thick necks, narrow backs, and high back-bones; the sides are good, the legs short, and bones large: in weight much the same as the Leicester; the wool heavier but coarser.

The short-woolled hornless breeds contain the

Herefordshire, having white legs and faces, and the wool growing close to their eyes; the carcass is well made, and affords excellent mutton; they bear very fine wool, from one and a half to two pounds' weight per fleece.

The store or keeping sheep of Herefordshire called *Cotling*, as also *Ryeland*, from the land where they feed, formerly being thought fit only for rye, but which now yields every kind of grain. They are pent into cots at night, winter and summer, and in winter foddered with peas-straw, barley-straw, and hay. The cots are low buildings, covered over, and made to contain from one to five hundred sheep, according to the flock.

The *South Down* have gray faces and legs, fine bones,

long small necks. They are low before, high on the shoulder, and light in the fore-quarters; the sides are good, and the loin tolerably broad; the back-bone too high; the thigh full, and twist good; the fleece is very short and fine, weighing from two and a half to three pounds: they prevail in Sussex, on chalky downs.

The *Cheviot* have the head bare and clean; faces and legs white, subject to spots of gray or dun; the fore-quarters generally wanting depth in the breast, and breadth both there and on the chine; the body is long; the legs fine, with clean small bones, well covered with wool to the hough. Weight of the fleece about three pounds.

The *Hardwyke* breed is peculiar to that rocky mountainous district at the head of the Duddon and Esk Rivers in Cumberland; they have speckled faces and legs; wool short, weighing from two to two and a half pounds, which, though coarser than the other short-woolled sheep, is yet finer than the heath sheep.

In France much attention has been paid of late to the improvement of the native breeds with a success equally satisfactory, though less general. The native races are, in general, middle-sized, with moderately large horns, or altogether without horns; the chaffron is much arched, the tail long and slender, the legs heavy, and the wool abundant and coarse. In colour usually white, but in the southern departments sometimes overbalanced by black, or brown-black. This general character is modified by the crossing of Spanish, English, and Flemish breeds.

The *Flemish* breed, common to both France and the Netherlands, is, in general, hornless, high on the legs, and derived from an intermixture with the Barbary long-legged sheep.

The *Solognot* breed has a fine head, small at the mouth, mostly without horns; and the wool curled at the ends only.

The *Berichonne* is distinguished by a long neck, the head

without horns, covered with wool on the summit; that on the body fine, white, close, short, and curled.

The *Roussillonne* furnishes very fine wool, the filaments or piles twisted spirally; it is derived from the Merino race.

The *Ardennoise* likewise extended over part of the Netherlands, is horned, and bears very fine wool; and the *Norman* is lately much improved.

In Germany this part of rural economy is likewise improved and improving; the Saxon and Bohemian flocks in particular furnish wool of a very superior quality.

We must add a dwarf breed mentioned by Mr. Bewick as brought from abroad. It was hornless; the wool round the head forming a sort of hood, with the ears erect in front; the forehead projecting, chaffron concave, and the lower jaw protruding, and shewing the teeth; the tail long, and wool white and curling.

America is destitute of indigenous domestic sheep; but the United States have been attentive to preserve and improve the breeds originally imported from England. Merinos have been introduced at high prices, but it is found in the Atlantic States that the Spanish Sheep accustomed to roam, do much mischief on small farms, and they are now mostly sent into the back settlements; nor is the object of woollen manufactures as yet in the States of the Union of equal importance with the clearing of land and growing crops: this branch of industry has, consequently, not continued to fix the national attention.

We need not enter upon a subject so universally known as the utility derived from every part of the Sheep, nor expatiate on the beautiful cloths obtained from wool in England, France, Germany, the Netherlands, and the United States. Our information on this interesting species of animal, besides personal inquiry, and fifty-six mostly original drawings in our portfolios, is principally derived from Count de Buffon, Messrs. F. Cuvier, Desmarests, Carlier,

and Tessier; and of British writers from Messrs. Pennant, Bewick, Bingley, Culley, Arthur Young, Dickson, Parkinson, Sir John Sinclair, Macdonald, Lord Somerville, and Dr. Parry; names who have deserved well alike of their country, and of mankind.

THE GENUS DAMALIS.

We have attempted to arrange the foregoing genera by a successive transition of their most prominent characters, from the Deer tribe to the Antelope, and from these into Capra and Ovis; but this arrangement allowed no natural location for those species of a large size, hitherto classed with Antelope, whose more equivocal characteristics approximate them to the Bovine nearly as much as to the Caprine nature; hence it appears necessary to interpose a new genus, the characters of which should embrace the evanescent distinctions of Antelope, Capra, and Ovis, together with the incipient characters which shew the approximation to Bos.

The native names of the animals thus generically separated, import that they are considered distinct from the Antelope in their own countries; and although no great stress should usually be laid upon local names, yet it would be treating the knowledge and experience of the resident nations with an indiscriminating indifference, if, upon inquiry, it should be found that from the earliest antiquity to the present time, every people who have intimate knowledge of the animals under consideration, should agree in bestowing one generical designation upon them, and yet that such designation should be rejected by systematic writers for one less analogous. Such, however, is the case with the groups of animals before us, which, whether they be Indian or African, have, in their local names, either something that shews their separation from Antelope, or, what is more common, a generic indication, which proves

them to be regarded as more nearly allied to *Bos* than to *Capra*. Where the Persian, Arabo Indee, and Eastern and Western Arabic, are concerned, it appears (whenever the names are obtained from well-informed natives under circumstances in which neither the inquirer nor the native can mistake the precise object of the question,) that all the species we are about to enumerate will be designated with the generical word *كاه* *Ghau*, ox or cow; *بقرة* *Baker*, oxen, cows, in the Arabic; or *بکرا* *Bakrah*, in the Persian. The *Oryges*, moreover, are almost as universally distinguished by a term which refers them to the Goat, (for the exceptions of the Bahrein Cow, or White Oryx, occurs in a country where the animal is a stranger,) the generical *بکرا* *Bukra*, being affixed to them; hence we may suspect that the similarity of sound among unlettered people, are the causes of the few mistakes which occur in these two genera, and in *Ovis*; *בארה* and *ברה* *Barah*, and its mutilations *Baa*, *Bery*, &c. Shaw, we have no doubt, was misled when he assigned the repeated name of Beker-el Wash, to a stag, whose true Arabic name must be *أجل* *Ajal*, as it is also in the Hebrew. How Aristotle, and his successors, first came to designate an African animal of the present genus by the name of *Bouβαλος*, cannot be explained but by the supposition that he gave that name (which it is worth observing is symphonic with that of the Buffalo, in all the dialects of Northern and Central Asia,) in consequence of some imperfect information which he may have possessed upon this subject through the Macedonian invaders of Eastern Persia. But we shall return to this question in the article Buffalo.

On turning the inquiry towards South Africa, where the indigenous tribes are scarcely removed from savage life, it nevertheless appears that none view these large species as in the least allied with Antelope; they consider them as large game of the desert or forest unconnected with other genera, or connect them with large ruminants, such as *Impoof* with

Impatoo, the Cameleopard, and *Nonne*, both an Ox and a Gnoo.

The very aspect of the animals is indeed sufficient to point out the probability of their being totally distinct from *Antelope*; but upon closer examination, especially of the spoils which usually are seen in Europe, we confess that it is very difficult to establish characters sufficiently general, to justify the proposal of a new genus. We find, however, that the species intended to be included within it, are all of a large or above a middle stature; that the interscapular or first vertebræ of the back are usually much elevated above the rest of the spine, and the posterior extremities more or less shortened when compared with the anterior; the horns, placed on or even above the ridge of the frontals, have within the osseous nucleus or core, a considerable cavity, communicating, in all the species we have been able to examine, externally, by a sinus which passes under the horny substance, nearly opposite the root of the ear*. The head is long and heavy; the neck rather short in proportion, with something like a constrained arching; the throat and neck with more or less mane and beard, hanging in a tuft, or loose along a true or partial dewlap; the tail descends to the houghs, being terminated by a large tuft; the legs, though well proportioned, are heavier, the animals more unwieldly and less swift than Antelopes, and their form gives them a particular mode of standing with the haunches under them. One of the species only is noted for spirit and fierceness. Although the compound name *Acronotus* might best designate the obvious external character of the groups in this genus, it has been thought advisable to propose that of *Damalis*†, because in the

* Naturalists well know the difficulty attending researches which are supposed to injure the specimens; here the saw is absolutely necessary.

† Δαμαλῖς, *vacca*, *Juvenex*; ἀκρὸς, *altus*; ὠτὸν, *scapula*.

Greek it is applicable to the young bull and the adult cow, and in several languages of Europe and Asia, the first, or leading syllable constitutes a part of the name of several other ruminants, and therefore in zoological phraseology it may be adopted for a genus. As the proposed sub-genera which are included in it stand, they may be regarded as osculating on the one side with the *Aigoceri* in the genus *Antelope*, and on the other with the *Bisontes* in that of *Bos*.

The animals of this genus, which reside in South Africa, are subject to a destructive epidemic, known among the Colonists by the name of *Brant Siekte*, or burning disease, which commences by a cutaneous eruption about the close of the rainy season; the hair falls off, the skin is covered with scurf, the joints stiffen, the beast languishes, consumes, and dies. All the Antelopes are subject to it, but the species placed in this genus *Oreas*, *Caama*, *Strepsiceros*, and in the next *Gnoo*, are the chief sufferers, and sometimes infect domestic cattle.

THE ACRONOTINE GROUP.

Professor Lichtenstein first formed a group analagous to this, under the name of *Bubalides*, which included some species we refer to *Nemorhædus*; M. De Blainville afterwards formed his sub-genus *Alcelaphus*, clearly circumscribed, and to which no other objection can be made than that the compounds of the name refer both to the genus *Cervus*, and therefore denote ruminants with deciduous horns. We characterize our sub-genus *Acronotus*, by horns with double flexure, more or less bent, seated on the summit of the frontal crest, approximated, annulated at base, smooth at the points, which are turned backwards or inwards. They are common to both sexes; the head long; front narrow; muzzle almost none, or half; small lachrymary opening; no tufts on the knees; inguinal pores; the first vertebræ of the back much elevated; the croup

sloping; tail terminated by a tuft, hanging down to the houghs. The females have two or four mammae, and the group is confined to Africa.

The *Bubalis*. (*D. Bubalis*.) This species was known to Aristotle, Oppian, and Pliny, but Belon and Caius were the first of the moderns who described it. The proportions of the *Bubalis* are rather heavy, the head is long and clumsy, and the singular elevation of the shoulders is remarkably striking. Its general appearance is not unlike that of a small cow; the horns are stout, obliquely and obscurely grooved, approximating at base, then diverging and bent forwards with the tips thrown back again, resembling some of the forms which distinguish Antelopes, excepting that the flexures are the reverse of what they appear in the lyrated species of that genus. In the males they are about thirteen inches long, somewhat less in the females, and black in colour; the eyes are placed very high in the head, and there is a very distinct lachrymary opening. The stature of the animal is above that of a large stag at the shoulders, but it is lower behind, and the body appears less. It is wholly of a yellowish-dun colour; the tuft of the tail alone being sometimes black, and the internal face of the thighs, the pasterns, and the edge of the nether jaw, somewhat whitish.

The species is found in the deserts, and as it seems also in the forests of Africa, north of the line, from the Nile to Morocco: it appears that Messrs. Denham and Clapperton allude to this species as seen in the woods of Bornou. The Arabs consider them as small cattle or buffaloes, *Bukr el Wash*, and *Bukr al Washi*, or cattle of the forest. According to Shaw, they live in small troops, and are easily tamed, mixing and grazing with domestic oxen. The ancients had observed that the horns are not used by them in fighting, and we may add that in running their action is not like that of Antelopes.

We have seen two living specimens and several prepared

skins; in one of an old male, a tuft on the throat was observable, but scanty and deciduous; perhaps the season of copulation is indicated by its presence: the young animal is like a domestic calf, and wholly pale buff.

The *Caama*. (*D. Caama*.) Baron Cuvier first separated this species from the foregoing, to which it has considerable resemblance in stature, colour, and in the curves of the horns. The head is still longer but finer than in the former, the horns placed so high as to stand upon a ridge elevated above the frontals, and so close together that they have been described as forming but one root; they are very robust and black, anteriorly with ponderous knots, diverging at base in a parallel direction with the forehead, then suddenly turning forward, and the superior half again bent back, and ending in sharp points; the knots are five or six, extending to beyond the backward flexure, and the rest smooth. At the base of the horns there is a large black spot, and from the centre of the forehead a broad streak of the same colour passes down the face to near the nostrils; the chin, and a narrow line on the ridge of the neck, are black, also a streak communicating on the middle of the shoulder, passing downwards on the anterior face of the fore-legs, and ending upon the pasterns, and on the middle of the thighs a broad streak of similar colours defines the base of a large triangular white space which covers the buttocks, and from thence passes to the houghs, the tuft at the end of the tail is black; the head, back of the ears, neck, shoulders, outside of the legs, flanks, and hollow part of the thighs, are of a lively ochry yellow, darkening on the summit of the shoulders, back, and croup, into a bright rufous, as far as the posterior part of the hips, where the point of the white triangle commences; the region round the mouth, inside of the ears, internal face of the fore-legs, breast, belly, inside of the thighs, and anterior part of the hind-legs, are white; the edge of the sternum pro-



"Horned Antelope" 1847
H. Brown del.

H. Brown del.

THE C A M A .
D A M A L I S - C A M A .

jects somewhat pointedly, forming an incipient dewlap, lined with coarse hair; the hoofs are pointed, black, and strong.

The Caama is a majestic animal, whose shoulder is not so high in proportion as in the former, measuring at the withers five feet in height; the croup is not greatly depressed, and the length of a full-grown specimen, from nose to tail, exceeds seven feet and a half. The female is nearly a foot lower in stature, the horns are shorter, legs prominently knotted, and the points shorter; the colours of the fur are distributed in a similar manner, excepting the black on the hind-legs which extends down the hough to near the fetlock, where it ends in a kind of band: this colour is often only deep brown. The hide of both is black, as are also the macamae. In the half-grown calf the colour is entirely buff, excepting the triangular space on the rump, which, however, is much smaller, and the black appears faintly upon the pasterns; the horns are nearly straight, parallel, and slightly wrinkled. In the Paris specimen the horns appear pressed together, no doubt from package and drying in that form; a circumstance which has misled Zoologists on other occasions.

This species resides in small flocks of ten or twelve, on the more barren parts of the interior of Caffraria. The males, who head a family, expel the adults of their sex; they are not very swift, and stop to turn round when pursued; they fight by dropping on the knees, like the Neelghau; their voice is not unlike a kind of sneezing. The venison is very good, with a flavour of beef; but they have been so much hunted that the species is become rare within the colony. The female bears but one calf, which is brought forth in September or April. It is the Caama of the Caffre, the Hartebeest of the Colonists, and Cervine Antelope of Pennant and Shaw; who have thus confused the meaning of the Dutch word *beest*, as it is

here applied, bearing the same interpretation as *beast* with English grazers, and therefore Hartebeest signifies Ox-Stag. There is a fine specimen of a male in the British Museum, and one of an old female in the Museum of the Missionaries in London.

The *Collared Damalis*. (*D. Suturosa*.) This species, very recently noticed and described by Mr. Otto under the name of *Ant. Suturosa*, belongs, unquestionably, to this genus, and most probably to the present *racemus*. Its structure is, in general, rather heavy, assuming a bovine appearance; the body is long and bulky, the head large, the neck short and thick, and the limbs low and strong; the internal edge of the nostrils is naked and black; the eyes are rather small; the ears middle-sized, of the usual form, and lined within with hair; there is no appearance of a suborbital sinus; the horns are large, annulated, round, with double flexures, nearly vertical at base, then suddenly bent backwards and outwards, the remainder turning again so that the long smooth points are directed upwards and to the rear; the tail is flat at base, stiff, and becomes very slender, terminating with a tuft of hair, which hangs down to the heels; the mammae are four in number. The colour of the animal is in general a gray-brown, turning yellowish, but the croup, the belly, feet, and lips, are white; on the forehead is a space of blackish-brown hair, above which a large white spot is found, irregular in form, and two others of the same colour, but smaller in size, are marked, one behind the eye, and the other beneath the ear; that organ is of a paler colour than the rest of the fur, and on the edge and within, white; the tail is whitish, but the tuft of a mixed white and brown.

This hair is dry and fragile, as in the Stag, and its length very unequal; on the face and chaffron short; the dark space on the forehead longer and spreading. Upon the neck there are three streaks of long hairs like collars, rather

singularly arranged, the first descending from the root of the ears unites under the throat; the second begins upon the nape of the neck, ending at the sides of it, a little beneath, and in the rear of the origin of the first; the third, by far the most considerable, forms a large tuft of long hairs, standing up or inclining forwards upon the ridge of the neck, then descends upon its sides and joins anteriorly the band beneath the throat, and extends downwards to the breast. Upon the middle of the back the hair is likewise very long, those of the after part of the body being directed towards the tail, and those of the fore part towards the head. There are, besides, several other small streaks or tufts of longer hair upon the limbs, neck, and flanks. Dissection offered nothing remarkable in the skeleton or viscera: the intestinal canal was more than eighty-three feet in length. Mr. Otto observed only one individual, a female, perfectly adult, about four feet long; the tail one foot. It was sent from a menagerie without indication of its native country.

The learned professor does not mention whether in this species the shoulders were higher than the croup, a circumstance which may have escaped observation, because females in general are lower at that part than males. It is to be regretted that the dimensions, at least, in the abstract, found in the *Bulletin des Sciences Naturelles*, are not more detailed. It may be surmised that this species belongs to Central Africa, and there seems to be some affinity between it and the *Tragelaphus* of Caius, which we refer to the genus *Ovis*.

The *Koba*. (*D. Senegalensis*.) Of this species so little is known that there may be an error in placing it among the Acronotine series of *Damalis*, but as it appears to have some affinity with the following, whose location in this group seems to be proper, we place it here until further observations decide the question. The skull and horns of the animal were brought from Senegal by Mr. Adanson.

and described by Buffon; and we hear that another has been brought by Messrs. Denham and Clapperton from Central Africa, where the natives called it Korrigum; but as the short notice on the subject unites Koba and the Senegal Antelope, some doubt respecting the identical species must remain. According to Adanson, it is known to the French on the Senegal by the name of *Grande Vache Brune*, and it may be conjectured that the herds of dark-brown Antelopes observed by Messrs. Smith and Cranch, during their disastrous journey in the vicinity of the Cougo, were of the same species. M. de Blainville, however, gives the following concise notice of this species. "It is confounded with *A. Pygarga*; in size equal to a Stag; horns laterally compressed, lyrate, nineteen (French) inches long, with fifteen to seventeen rings about the lower end, and smooth at the point; head fifteen inches long; ears nine inches; colour dark rufous; belly dirty white; knees with black spots; legs slender; hoofs small; tail a foot long, black, covered with long hairs*."

The *Sassayby*. (*D. Lunata*.) Mr. Daniell figures a male animal under the name of Sassayby, with the characters of an Antelope, but without a description. The horns in his plate, have certainly a great affinity to that genus, but

* By the drawing and dimensions of the head in the British Museum, which we have since received, *A. Senegalensis* of Captain Clapperton, is the Koba. The head is fourteen inches and a half long; facial line convex, with a dark streak down to the nose, which terminates in a broad black muzzle; the cheeks are brownish; lachrymary sinus not very evident; horns placed on the summit of the frontal ridge above the plane of the occiput, as in the former species, nineteen inches long, five inches and a half from tip to tip, curved backwards and inwards, with sixteen annuli, five or six semi-annuli at base, where they are seven inches in circumference. Mr. Pennant's *A. Senegalensis* appears to be a compound made from the skull, brought by Mr. Adanson, and the skin of *A. Caama*, which that author bought at Amsterdam.



THE SASSAY OF *Lunatic*

DAMAEUS LUNATA — *HAMILTON* — *1866*

Lunatic — *1866*

London: Published by J. B. Whitson & Son, 1866.



Dicotyles
Parceps ————— *Palmaris*



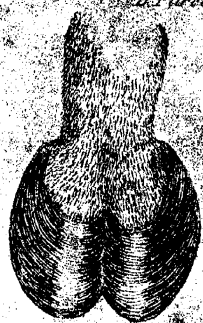
Dicotyles
Synagalis



D. Parceps



D. Palmaris



Hoof of *A. Asiaticus*



Brush on the knee of
A. Asiaticus

they approximate to each other much at base; the shoulders of the animal are greatly elevated; the back slopes down considerably towards the croup; a black space surrounds the root of the horns, and extends down the face; the legs are dark anteriorly, and the ears are very long. This description, though destitute of dimensions, approaches the figure to *Bubalis*, but is insufficient to fix it in the present genus. Mr. Burchell, however, during his valuable travels in Africa, obtained a specimen of an unknown species; the skin was injudiciously mutilated at the Cape, but the parts re-united, are still sufficient to determine that it belongs either to the *Sassayby* of Daniell, or to a species nearly allied to it; the doubt arising solely from the want of dimensions and description of that species, and from the horns in the plate, which represents the male, being rather slender, bent outwards and upwards, with four prominent annuli; the neck long, and the body and limbs slender; whereas, Mr. Burchell's are the spoils of a female with robust horns, rising on the summit of the frontal crest, at base rather close together, swelling out a little forwards and then backwards, with the upper ends again forward, the general sweep being lateral, and rounding upwards, with the points turned towards each other, thus forming two segments of a circle, and when seen in front, representing together a perfect crescent. They are two inches asunder, nine inches and a half long, five inches and a half in circumference at base, and ten inches distant at the tips: near the root are six distinct and rather distant wrinkles, above which are six obscure or incomplete annuli, the whole occupying about half of the length, the rest being smooth, and the colour black. The skin is four feet six inches long from the nose to the tail; the neck short, the body bulky, and the head broad at top with a convex forehead, and bearing a *Bubaline* appearance; the height at the shoulder, in the present state of the subject, is about

three feet, and two feet eight inches at the croup ; the fur is of a deep blackish-purple brown ; the ears are asinine, six inches and a half long, abundantly lined with light hair within, and on the edges ; there is a lachrymary sinus beneath the eyes ; the face is straight, and the nostrils separated by a demi-muzzle ; the colour of the face and back of the ears rufous-dun, with a black streak commencing between the horns, contracting between the eyes, then again widening to near the nostrils ; the legs are robust and rufous, with short, stout, and black hoofs ; the tail descending to the houghs, is terminated by a tuft of long black hair ; the number of mammae could not be ascertained.

It is probable that Mr. Daniell's figure, represents a young male. The adult of that sex must of course be larger and the horns still more powerful than those of the female we have described, and probably also more ponderous in its proportions. Mr. Burchell fell in with only this one specimen in the Booswana country, where the species must be rare, but probably it is more abundant on the desert of the southern Sahara, beyond the Gareep : both this and the Koba may possibly hereafter form a separate section of this, or of the genus *Antelope*.

THE BOSELAPHINE GROUP.

We circumscribe this group, originally instituted by M. de Blainville, to the single species of *Oreas* of authors, and to a supposed variety, which deserves the denomination of a species. The Boselaphi are among the highest and most bulky ruminants, and although the horns have a distant resemblance with some of the middle-sized Antelopes, their stature and ponderous make, thin heavy dew-lap and elevated shoulders, bring them more properly into the present genus. In this group the horns are common to both sexes, they are heavy, very robust, placed on the summit of the frontals, transversely wrinkled,

straight, or slightly bent, with the tips forward ; brown or gray in colour, twisted upon their own axis, which is on the prolongation of the plane of the face, with a ridge more or less prominent, forming a spiral turn round them ; a large sinus in the lower part of the bony core? the rest partially porous ; the animals have a muzzle, no suborbital sinus, a mane on the neck, a broad and deep dewlap furnished with long hair, and the females are provided with four mammae forming an udder. The group is confined to Africa.

The *Impofo*. (*D. Oreas*.) Of all the animals of the genus *Antilope* of former authors, this is decidedly the largest, weighing often above eight hundred pounds, and measuring between eight and nine feet in length. A female in the Tower was five feet high at the *shoulder** ; the head is long and square to the extremity of the foremost grinder, then tapering to the muzzle, which is broad ; the facial line straight, and the horns rise from the summit of the frontals along the plane of the forehead. In the male they are exceedingly bulky, from one foot and a half, to two feet long, straight, in old age bent forward at the tips ; each formed as if two horns were united into one, whereof the first should form the axis, and the second, a spiral ridge twining around it, commencing on the forehead, and turning outwards till they are lost near the tips. The skull is without lachrymary depressions ; the forehead flat, and two small cavities exist on each side of the connecting sutures between the frontals and nasal bones. The proportions of the male are little inferior to those of a domestic bull, but with the bones of the legs more elongated ; the circumference of the body, behind the fore-legs is above seven feet ; the posterior part of the head and neck are very thick ; the shoulders much raised, producing great depth of the fore-quarters. Beneath the gullet is seen an enlarged larynx of

* Mr. Barrow mentions a large male six feet and a half high, and ten feet and a half long, but it is not stated how the dimensions were taken.

the size of an apple, and lower down the throat, the skin becomes lax and pendulous, forming a very large dewlap, ending in a point towards the front, and fringed anteriorly with dark bristly hairs. On the middle of the forehead there is a reversed crest of bristles, passing upwards between the horns and along the ridge of the neck to the extremity of the elevated withers; the carcass is round, and rather long, the croup a little depressed; the tail, about two feet long, is terminated by a tuft of coarse black hair. The hair is soft and rather woolly on the face, harder on the rest of the body, but more thinly scattered; rufous passing into dun and buff in colour, which being spread upon a black hide produces a dirty-gray; the legs are more rufous and buff, and the hoofs greatly resemble those of a Guernsey cow.

The females are little inferior to the males in height, but shorter of body; their neck is less voluminous, the dewlap smaller, and the horns more slender and longer; they appear to be and really are lighter animals than the males: the horns diverge more; the two spiral turns of the ridge, have a swelling of the axis between them, which appears like a third knot, above which they bend backwards, become slender and pointed, their length extending from twenty to thirty inches; the face is more rufous, and the back more ashy.

These animals are gregarious and said to live in herds, where the sexes are kept separate, the males flocking together and the females feeding apart; but this opinion seems to have arisen from the practice of the old bulls expelling all the others from the herd, who are thus compelled to live together. The females, being more active than their ponderous chief, surround him, so that he is not immediately distinguished, except by experienced sportsmen, who, knowing that his carcass is the fattest, the hide the most valuable, and speed the least swift, select him out and run him down. Formerly, when the species was more



THE KUDU.

DAMALIS DREAS.

abundant, this was done so much at the leisure of the Colonists, that notwithstanding the invariable endeavours of this game to fly to windward, they would drive it in the direction of their own homes, and bring it down only when they judged it convenient for their servants to transport the carcass into the house. If they pushed the animal too keenly, it was subject to drop down dead, melted tallow running out at the nostrils; these are the causes which make the females appear occasionally without a male, but this cannot be long, for the species is asserted to have no regular rutting period, the females being found in calf all the year round.

At present the Impoof is mostly found amid the rocks of the Karoo districts, along with Gnoos, Guaggas, and Ostriches, galloping clumsily, but leaping and traversing broken ground with considerable facility. It is by nature docile, and readily tamed, but though its strength is great, the shoulders do not seem to have sufficient solidity to bear the labours of domesticity with advantage to the agriculturist. The flesh and marrow are highly esteemed, and the hides of the males considered excellent for traces and other coarse and strong gear. We have compared a living specimen with several skins, and many heads and horns. The name of Coesdoes or Condoma of Buffon, belongs to a different species, and seems derived from the Hottentot K'gojes, signifying a cow; but the real name in that language is T'ganna, or T'gaun, and in the Caffre dialect Impofo. The Dutch have bestowed a most improper name on it, solely derived from its stature, it is that of Eland or Elk.

The *Canna*. (*D. Canna*.) There is a second animal of this group, as yet but little known, and vaguely noticed by travellers as a variety, but which, upon examination, is found to be possessed of characters, fairly entitled to claim a difference of species. We designate it by the name of Canna,

merely to make a distinction with the former, and because the Caffres use this appellation for the present animal, and Impoofo only for the other. The Dutch Colonists distinguish the two, by adding the word Bastard to the word Eland for the Canna, which implies that they consider it a spurious Elk, in the same manner as they distinguish two species of Gnoo, by adding the same epithet of Bastard to one of them. The Canna is not so large as the Impoof, more slenderly made; the head is shorter, and the horns are deprived of the prominent spiral ridge, being only obtusely angular in front, forming one spiral twist towards the point; they are more parallel, very closely wrinkled, half-way up, and bent back from their root beneath the line of the face; the point is turned forward, and their colour is dirty horn. In one female specimen they measured twenty-two inches, in a male seventeen inches; these were more robust, divergent, and somewhat undulating in their ascent, and standing four inches asunder at base; a circle of loose soft hair of a darkish colour, feathers on the forehead, and a narrow dark streak passes half way down the chaffron; the anterior canthus of the eyes is prolonged, and forms a small lachrymary opening, beneath which there is a dark angular spot, pointing towards the nose. The shoulder is not much elevated, but the ridge of black hair is similar to that of Oreas, excepting that it is not recurrent; the dewlap is small, furnished with long black hair; the ears, not so long as in the former, white on the inside and on the outside, together with the head, of a mixed tone of buff-gray and brown; the nose and space round the mouth, dark; the rest of the neck, body, &c., dark brown-gray; a small space between the fore-legs white; the tail entirely black does not reach to the houghs, and the legs beneath the joints are dark; the hide is black.

Occasional troops of this species are met on the same grounds, with the Impoofo and Koodoo, but they never in-

termix, and beyond the Gareep, upon the Great Desert, they are more numerous, but unattended by the other two species. There is a drawing in the Banksian library of this animal, by Dr. Forster; it is a young male which was kept in the Menagerie of the Cape. Mr. Daniell has figured an adult female, under the name of a variety of the Cape Elk *; we have compared these with the skin of an adult male, and with several skulls.

THE STREPSICEROTINE GROUP.

Several Antilopine characters are recalled in the forms of this group, but others approach the genus *Bos* even more than the last. Of the former, the ridge and spiral figure of the horns, and the constant white mark passing over the eyes and across the chaffron, shew an affinity with the last species of the *Oryges*; of the latter, the texture of the horns, smooth, without wrinkles, pale in colour, and dark only at the tips: the breadth of the muzzle and real dew-lap, evidently bring the group into the intermediate state of the present genus. On the neck there is a long mane, and a beard on the chin; the osseous nucleus of the horns is porous at the upper end, and provided with a deep cavity near the base, communicating at the back of the head, with blood vessels passing over the parietal bone; the lachrymary sinus is wanting; the ears are broad and open, and the structure of the legs firm. The females are without horns, and are provided with four mammæ, forming a small udder. This group is confined to Africa.

The *Koodoo*. (*D. Strepsiceros*.) This magnificent animal is chiefly distinguished by the horns being placed on the summit of the frontal bones, bulky at base, compressed, marked anteriorly with a ridge, forming along with the horns two complete spiral circles, the tips turned forward

* *Sketches &c. of Southern Africa*, 1820.

and outwards ; they are slightly rugous at the base, then smooth, pale, darkening near the summit, and the points white, standing close on the head, and regularly diverging ; the spirals of the turns so exactly arranged, that a spear might be thrust into the temples, through both the openings of the curves ; the forehead is flat and square, the chaffron straight, and the muzzle broad. The ears stand out obliquely as in the Ox, broad in the middle, and pointed at the tip ; the neck is thick, the withers high ; the croup rather depressed, and the dewlap anteriorly square. On the forehead the colour of the hair is black ; a white line passing over the orbits, unites and forms a kind of crescent on the chaffron ; the chin likewise is white, and furnished with a kind of beard, which, as in the Aigoceri, soon drops out ; but from the throat to the end of the dewlap depends a long and loose fringe of coarse black hair, and a similar ridge forms a mane on the neck, and stands up over the withers to the middle of the back. Beneath this mane a line of white hair passes down the spine to the tail, traversed by four or five others from behind the shoulders to the hips, and two, three, or four more across the croup, forming in all eight or nine cross streaks, which terminate at the belly, or on the thigh ; the edge of the buttocks is white down to the houghs, and long hairs of the same colour fill the anterior part of the ears ; the chaffron, sides of the head, back of the ears, shoulders, body and croup, are of a buff-gray, usually appearing darker in stuffed specimens ; the inside of the ears, behind the white piles, throat, dewlap, belly, and legs rufous-buff ; the tail, which does not reach to the houghs, is white above, edged with grayish-dun, and terminated with long black hairs ; the hoofs are short and firm. The male is from three feet eight inches to four feet high at the shoulder, and above eight feet long, exclusive of the tail, which measures two feet. The female is some inches lower, without horns, and more

faintly marked with three or four cross lines on the sides, and one or none on the thighs: in the calves the marks are less perceptible.

The Koodoos live singly, or in pairs, in the woody districts of the eastern part of the Cape Colony, and Caffraria, on the plains of the Karoo Mountains, and about the sources of the Gareep, feeding on buds and shrubs: they are becoming daily more scarce. They are very powerful and active, bounding with great force to a considerable height, but like the rest of those animals which are lower behind than before, they are not very fleet when chased by dogs; the males naturally bold, soon stand at bay and defend themselves with spirit. They are easily tamed, and mild when kept in a menagerie: the females bear but one calf at a time. We have compared five specimens of males, one female, and above thirty heads and fragments; the best figure extant, is that of Mr. Daniell.

Among the zoological plates in the *Encyclopédie Méthodique*, there is a front view of a head without name which we consider to represent a young male of the above species.

Professor Herman in his *Zoological Observations*, describes a pair of horns under the name of *A. Torticornis*, which appear to belong to the Strepsicerotine group of the present genus. They are slightly rugous, closely spiral sub-compressed, and sub-carinated; measuring in a straight line twenty-three inches, and on the curves twenty-six inches, six lines, French measure, or about twenty-eight inches English; they weigh one pound thirteen ounces. Native country unknown.

Professor Afzelius in the *Nov. Act. Upsal.* tab. 8, fig. 3, represents a round horn, turned spirally, once and a half in a loose ascent, with a slight ridge; the base finely wrinkled,

and on the rest of the surface small longitudinal striæ. It measures two feet ten inches in length, and eleven inches in circumference at the base. This horn was brought from Sierra Leone. M. Desmarests suspects that it belongs to a species of ox, if any were known in that country. Cattle are certainly found in the interior, and horns artificially twisted into spiral turns, are often seen on the heads of favourite oxen in Caffraria, and the practice may extend to the equinoctial line; but the presence of a ridge and the striæ, seem to refer the specimen to the present group, and we learn from a friend, who has resided on the west coast at different times, that similar horns are sometimes brought down for sale by the Mandingos.

M. De Blainville mentions a pair of horns attached to a part of the skin, observed by him in England. They were black, smooth, close together at base, bent outwards, and then turned inwards at the tips; they were still attached to a part of the skin belonging to the forehead, which was marked with a large dark space, with a triangular spot of white, symmetrically shaped into a crescent, commencing at the base of each horn, the rest of the chaffron supposed to be white: this fragment is unknown to us, and might be of the Young Addax, or of the *Strepsiceros*, but the figure is not very satisfactory.

THE PORTACINE GROUP.

In this group we place the large species of Southern Asia, still more connected with the Bovine genus than the preceding, by the position of the horns at the sides of the frontal crest, the complete muzzle, bulky round body, and cow-like feet. They are connected with the Damaline genus, by the cavity in the nucleus of the horns, the elevated shoulders and depressed croup; by the mane on the neck, the tuft beneath the throat, and an incipient dewlap. The females are provided with four mammæ, but destitute

of horns : of Antelope they retain only the deep suborbital sinus, and some portion of their manners.

The *Neelghau*. (*D. Risia*.) Of the large ruminants usually placed with Antelope, the Neelghau, or *A. Picta* of authors, is the only Indian species which unquestionably required to be transposed. We propose to reject the name of *Picta*, which Pallas adopted from Mr. Pennant's character of *White-footed* Antelope, a character by no means constant, and substitute the name *Risia*, from the Sanscrit *Ris'ya*, or *Rishya*, because it is derived from the Hindee *Rojh* *, the animal being designated by that word in the *Amera Cosha*, and in the *Indian Sacred Volume*, chap. xxiv. ver. 27, where three *Rishyas* are directed to be consecrated to the deities, named *Vasus*. The Neelghau in common with the rest of this genus, is never regarded by the natives as in the least allied to Antelope. Its name imports *Blue-Ox*, in the Persian dialect used in India. In stature this species measures at the shoulder about four feet four inches, and at the croup four feet; the legs are not disproportionably long, but the anterior part of the body is very deep; when standing, the hind-feet and croup are generally gathered up, or drawn in. The head is long and pointed; the forehead arched, with the horns rising at the sides of the frontals, far asunder, sub-triangular, thick at the base, a sort of blunt ridge passing downward upon the forehead; the rest rounded, a little elevated above the plane of the face, bending slightly forwards and outwards, black, smooth, and about seven inches long; the lachrymary sinus is considerable; the eyes full and dark; the nose enclosed in a square and black muzzle; the incisors small at the sides, the middlemost long; the ears seven inches long, very broad, white inside and marked with two black streaks; the neck rather long, maned with black

* *Rojh. Raksh?* Lightning; may be a figurative expression for the velocity of its attack.

standing hair down to the withers, and upon the throat a long tuft of coarse hair hanging down to the dewlap; the colour of the head, neck, and body is slaty-gray; sepia or brown on the face, round the mouth and on the legs; the fetlock joints often, but not always marked with one or two white rings. The tail reaches to the houghs, inserted in a groove at the buttocks as in the Cow, and terminated by a tuft of long black hair; the hoofs rather broad and pointed, resemble those of a cow; the under-jaw, a space round the eyes, the throat, belly, and buttocks, are sometimes white. The female is smaller, lower at the shoulder, without horns, and much resembling a hind; the fur of her coat is usually ashy rufous-gray, though sometimes slate-coloured, like the male; under the throat is a tuft of hair, and the mammæ are four in number; upon the feet there is occasionally a third white spot. Gestation lasts nine months, producing commonly only one calf.

The Neelghau is an animal of very considerable vigour, petulant, sometimes vicious, not remarkable for fleetness; residing in pairs, or alone, on the borders of the Jungle, and in the woods of Northern India, where it affords a common meal to the Asiatic Lion, and sport to the grandees, who hunt these animals, as formerly, with whole armies, and in the same manner as Bernier relates, that Aurengsebe conducted this sport between Lahor and Delhi. To the British residents it affords no such interest, because they will not employ the formidable array of elephants, unless to attack the Rhinoceros, the Lion, or the Tiger: and the Neelghau appearing not to be accessible, but in the vicinity of the large Carnivora, these always obtain the preference. It is moreover considered an animal, when driven hard, that will turn upon horsemen, and be the first to charge. They are still common in Central India, in the districts of Kamaghur, &c. where their mangled carcasses are often found, and where on one occasion, several of our friends observed that no less

than three lions had shared the quarry. They are spread over the valleys and plains, at the foot of the Himalayah range, where forest and heavy cover is at hand, and it may be this animal which in the *Penjab* is known by the Persian name گوزن *Gaw-zan*, or Ox-stricker.

In a domestic state they are unsafe, as their attack is sudden and without warning, uttering only a low muttering sound, and drawing the hind-legs under them ready to drop and attack; for when this is intended they fall on the knees, and suddenly spring forward with prodigious force and velocity. Mr. Hunter, the celebrated anatomist, who kept several in a paddock, certainly exposed himself to their attacks, for they always dropped on their knees on his entering, and there are instances when both horse and rider have been prostrated by a charge of these animals. When the males fight ~~against~~ each other, they kneel at some distance and approach in this manner until within a few yards, when both spring forward and dash their heads together with the greatest violence. An instance is related of one shattering a boarded paling by the force of his spring, directed against a labourer who was passing unconsciously on the other side. Their sense of smelling appears to be very acute, and constantly used with a loud rushing noise.

Lord Clive introduced the first pair into England from Bombay, in the year 1767; they bred every year: another pair was afterwards presented to the queen. We have seen five together in London, and pairs several times, but from their vicious character, we believe that breeding them is abandoned. Naturalists generally agree, in considering the Biggel of Mandelslo, and Tragocamelus of Parsons, as the Neelghau, the latter seeming not to be a larger animal, when the pretended thirteen feet of height are reduced to thirteen hands: but there is still some difference in the colour and length of tail.

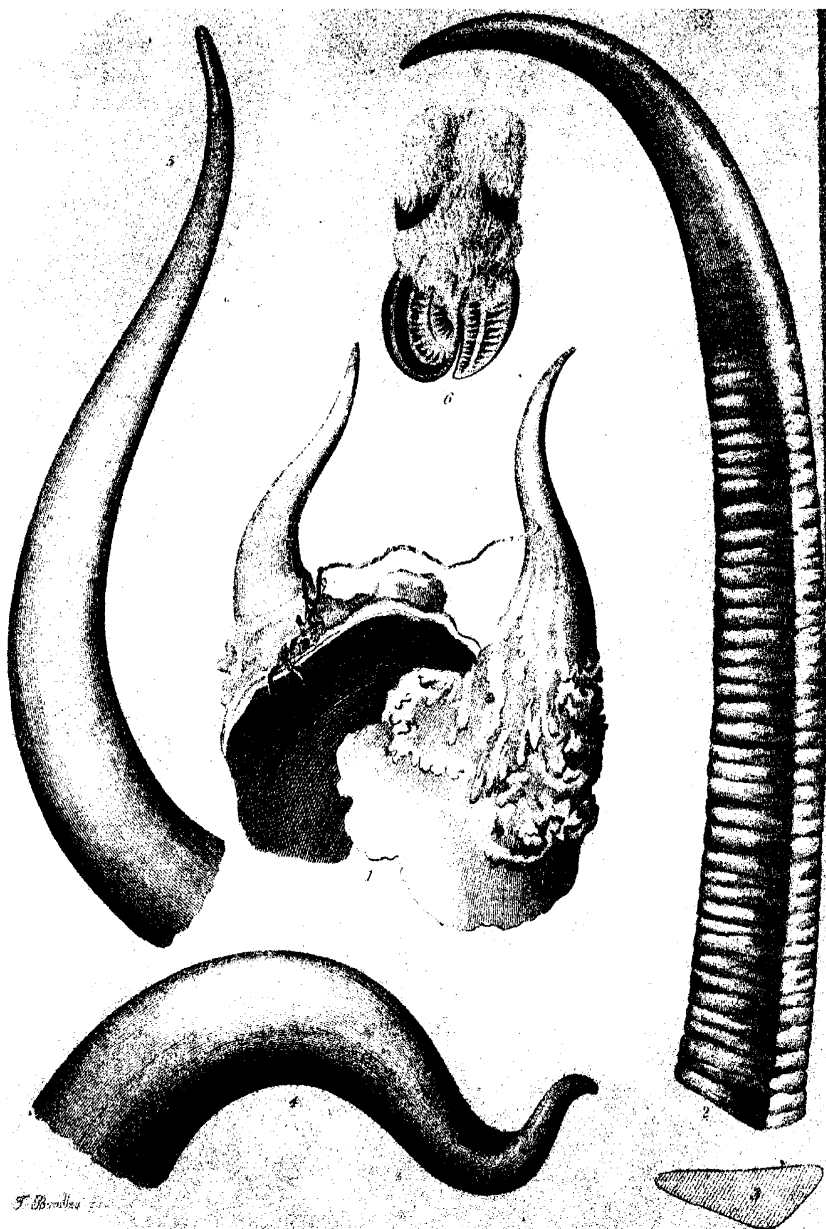
It is said that there is another species referrible to this

group, but as yet undescribed, which resides in some of the great islands of the Indian Archipelago, and our sub-genus *Anoa*, may ultimately unite with or osculate with *Portax*.

THE GENUS CATOBLEPAS.

Although the *Gnu* or *Gnoo*, here considered as the type of the genus, was hitherto classed with *Antilope*; it appears that Zoologists felt the necessity of moving it into one more nearly allied to *Bos*. Baron Cuvier, and M. F. Cuvier both admitted the propriety, and the latter gentleman in his description of a female *Gnoo*, not only establishes this necessity, but confirms the remarks which we made on the genus *Damalis*, by observing that when the multitude agree in assigning one class of affinities more than another from external characters, a generical type will be usually discovered more analogous to natural classification, than the arbitrary systems of nomenclators indicate. Zoology displays in almost all the genera, connecting links from one to the other, and in proportion as we advance in the discovery of additional species, the original characters of genera diminish in precision, till at length recourse must be had to a single character, or to an aggregate of several minor distinctions. In the present instance, however, these distinctions are much more decisive than those which separate *Antilope*, *Capra* and *Ovis*, and the genus which is here proposed, is not confined to one species, but to two, three, and perhaps four. With regard to the name here offered, we adopt it as a generic designation in deference to the high authority of the great Zoologist just named, and the direct testimony of *Ælian**, who represents “the *Catoblepas* as an animal of Africa; the native country of an immense variety of creatures, resembling a bull, but with a more fierce and terrible aspect; its eyes red with blood, resembling those of an ox, surmounted by large and

* *Lib. vii. c. 5, Æliani, &c.*



F. Bonfield

1. External & Internal view of the Horns of the *Quadrupus Brocheri*.
2. Horn of *Boa Arnd*, in the Brit. Mus.
3. Section of *Indus*.
4. Horn of the *Borau-Hundred Ox*.
5. Horn of the *Galla Hundred Ox*.
6. Left Forefoot of the *Musk Ox*, seen from below.

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elevated eyebrows, with an oblique look directed towards the earth; whence the name which it bears. Its mane rises on the summit of the head, descends on the forehead and covers the face, giving an additional terror to its aspect.

The generic characters which distinguish the *Catoblepas* from other ruminants are, a square head, with horns in both sexes, flat and broad at the base, nearly joining, lying outwards on the frontal ridge, in general turning down with the points uncinating upwards; they are without annuli, wrinkles, or strizæ, but round and smooth from their points to where they join the head; the muzzle is very broad; the nostrils bovine, and provided internally with a valve of a triangular form, which opens and closes at pleasure*, and glands on the cheek. They have a mane on the neck, and a considerable beard upon the throat; a small dewlap; a ridge of hair on the chaffron; bristles round the eyes, and upon the tips; the carcass and tail of a horse, and the legs like those of a stag. The genus is confined to Central and Southern Africa; is possessed of uncommon vigour and swiftness, is vicious and pugnacious, living in herds on the desert, seemingly as regardless of shade and of water, as the Quacha, or the Ostridge.

The *Gnoo*. (*C. Gnu*.) This species is the smallest of the genus yet known, measuring at the shoulder not more than three feet nine or ten inches, and from nose to tail little more than six feet six inches. The head is square, the neck thick, the shoulders deep, the body very short and rounded, the croup broad, with a pillow of fat upon each hip, and the legs long and finely formed, and composing altogether an animal exceedingly compact and active. The horns commence as in the Cape Buffalo on the summit of the frontals, very near each other, couched flat outwards,

* Observed by Dr. Leach, Mr. Cross, and myself; noticed by Mr. Gray, and originally by Mr. Pennant.

then becoming round, turn down forwards over the eyes and sweeping round with their points vertical; they are smooth, sharp, and of a blue-black colour, but paler, excepting at the tips, in old subjects. Strong bristly hairs of a black colour, directed backwards and sideways, extend over the face; beneath each eye there is a large tuft of similar hair; long white bristles surround the mouth, and other white bristles form a star-like circle round the eyes; a vertical mane, about four inches high, reaches from the back of the horns to the middle of the withers; in the centre it is black, but the lateral hairs are white, producing the effect of a white mane with a black edge; a hard bushy beard, lines the whole under-jaw; a dark brown ridge of long hair passes down the edge of the throat and dewlap, between the fore-legs to the end of the sternum; the tail is chiefly adorned with long white hairs, reaching to the heels, and ascending at the tip to near its root; the hair of the cheeks, sides of the neck, body, and legs, is smooth and close, of a deep brown, but in the female more ashy; the ears are not long or open; brown in colour; the hoofs are pointed and blue-black; the females are smaller than the male, their horns not so broad at their origin, nor so close together; the hair between them turning down and meeting that on the chaffron between the eyes; they have four mammae.

In old males the white hairs gradually disappear till all the bristles are black. The calf is at first pure white, with the hair on the face straight, and radiating round the eyes; soon after, or perhaps at the birth, two black prominences, rather distant on the head, shew the incipient horns; the muzzle is naked and black. We are, however, not certain that these characters apply to this or to the next species, but it is probable that both in this respect are alike; the dung of the Gnool is like that of a cow.

This species is lively, active, and petulant, trotting, ambling, and galloping with great swiftness; the males bellow somewhat like a bull; the young have a nasal murmur. They are sportive, and when alarmed always commence by playing with each other, striking sideways with their horns, but this lasts only a moment, the whole troop soon flies across the desert with amazing speed. They are gregarious, living in large herds on the barren deserts of South and probably Central Africa; at present none are found nearer the Cape, than the great Karoo district, where they undergo great vicissitudes of cold and excessive heat. It is not likely that they would submit to domestication; we always found them vicious: many have been brought to England, and from thence conveyed to the continent.

Dr. Sparman first classed it with Antelope, and his and Mr. Allaman's were the first figures, but Mr. Daniell's in the *African Scenery*, is the best published. M. F. Cuvier also published a good representation of a female. We have been assured by Mr. Daniell, that the species is particularly subject to a kind of bots, probably the larvæ of an *Oestrus*, which force their way into the nostrils, and numbers are expelled every time the animal snorts. This he observed in all that he met on the Karoo plains, and is possibly the origin of that disease which we mentioned as consuming the Oreas, Caama, and others; he may have seen it in the commencement of its course: the word Gnoo is of Hottentot derivation, the Dutch Colonists name it *Wilde-beast*, or Wild Cattle, or Ox.

The *Kokoon*. (*C. Taurina*.) Mr. Daniell first published the figure of this species, which, however, was already noticed by Professor Lichtenstein, and Mr. Burchell had deposited the spoils of one in the British Museum. The male is nearly four feet six inches high at the shoulders, but much lower at the croup, and five feet from the breast to the rump; the head, neck, and shoulders, are excessively

thick and powerful ; the head is shorter in proportion than the former, the nose still broader, but similarly formed ; the eyes, high up in the head, are protected by the overhanging of the horns ; these are placed similarly as in the Gnool, but not so broad at base, and marked with a succession of irregular rugosities about their root, and more distant from each other ; they are black, bent down sideways behind the ears, and then turned upwards with a sudden turn, but not to the front ; the forehead ascends high between their bases, and appears elevated by a thickening of the frontals, making the head one foot ten inches long ; the ears measure ten inches ; the tail furnished with long black hair, is three feet three inches long ; the neck is covered with a flowing black mane, reaching half way down the back ; from the centre of the forehead to the nose a protuberance of a cartilaginous nature, covers the whole chaffron, and is furnished with a ridge of long black hair ; on each side, towards the cheek and below the inner canthus of the eye, there is a circular glandulous naked spot one inch in diameter, with a spongy character, from whence a white viscous humour is distilled, and beneath it, is a tuft of black hair ; the chin is furnished with a black bushy beard, spreading along the under-jaw, down the breast and dewlap : the general colour of the animal is dark ashy-gray. It possesses neither the spirit, activity, nor speed of the Gnool. This description mostly extracted from Mr. Barrow's Voyage to Cochin China, is corroborated by Mr. Burchell's specimen, excepting that his appears to be entirely of a dark colour, almost black. The name Kokoon is derived from the Booswana dialect, which Professor Lichtenstein spells Kokong : he represents the hair to have a silky gloss, and the mane and tail entirely white, the horns stouter, and the flexure more knotty. It is found in the Caffer country, but not in the same place with the Gnool.

Dr. Blainville describes a pair of horns, black, smooth, close at base, thrown out sideways, and bending again inwards, round at base, and compressed at the points; seemingly belonging to this species.

The *Brindled Gnoo*. (*C. Gorgon*.) A third species, which, however, is somewhat doubtful, because it may be a mere variety of the last, is at present exhibited in the Museum of the Missionary Society of London. It is larger than the Gnoo, but inferior in size to the last. In the stuffed form, the neck appears more slender than either of the above; the eyes are near the summit of the head, and the horns, placed very close together on the frontals, stand up, bending outwards, and the points turned towards each other, present the figure of a pair of forceps. Suspecting them to be placed improperly, we inquired of Mr. Leadbeater, the very able artist in this line, who had set up the specimen, and learnt from him, that they are most certainly in their true direction. At base they offer no great development; they are whitish, smooth, round, tapering, and the points dark; on the forehead and chaffron are irregular depressions and elevations, not covered with bushy hair; the nose and mouth are flat and square, but much narrower than in the preceding; the ears not longer than in the Gnoo; on the neck is a long flowing mane of black hair extending half way down the back; there is no beard immediately beneath the jaw, but long black hairs descend from the throat down the breast; the tail is lined with black hair, which in the specimen is not longer than below the houghs. The whole animal is at present of a dirty sepia dun-gray, probably clearer when first obtained; over the neck, back, and shoulders, are indistinct darker streaks or brindles, running from the back down the sides, and in front of the upper arm, four or five cross streaks; the forehead and chaffron are sepia-brown, and the hair of these parts is somewhat longer than elsewhere. It was sent from

South Africa, under the name of *Wilde-beest*, or *Gnoo*, but we hear that it is distinguished by the Colonists, as the *Bastert Wilde-beest*, or spurious *Gnoo*, and may be regarded as the *Baas* of the *Namaquas*. We have named this species, provisionally, *Gorgon*, because that denomination was also bestowed upon the *Catoblepas*, according to *Cœl. Rhodius*, as quoted by *Gesner*.

The specimen from which we drew our description is not sufficiently accessible to ascertain the sex, but it appears to be a male, and the brindles are not now very distinguishable, though clear when our drawing was taken.

In *Mr. Brooks's* collection, there is a horn of a shining black colour, thirteen inches and a quarter long, the base nearly flat, very open, the surface forming a triangular figure, surmounted by the rounded part, which bends back, and then forwards; the flat triangular part, full six inches across, is open, and must have been placed on the base of the osseous core; it is at first smooth, where the hair covered it, and then suddenly rugous, with heavy confluent protuberances and pearls for the space of about four inches and a half, the rest converging rapidly to a round and smooth point. It is from the left side of the head and cannot be assigned to any of the above three species, nor to the *Musk-Ox*; it may therefore be designated by the name of *C. Brooksii*, the celebrated anatomist, to whom it belongs, and for the present be joined to this genus.

THE GENUS OVIBOS.

North America produces animals which resemble the last genus in so many particulars, that it would perhaps be more advisable to constitute *Ovibos* into a subordinate group of *Catoblepas*, wanting indeed the mane and beard, but equally slender in the limbs, and exhibiting some cha-



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The New London.*

THE BRINDLED GNOO.
CATOPLEBAS GORGON. Hamilton Smith.

Published by G. B. Whittaker, Pall Mall.

acters, which Pliny notices as particular attributes of the Gnou. The "*Fera Catoblepas Modica alioquin cæterisque membris iners, caput tantum prægrave ægre ferens ; id dejectum semper in terras, &c.*" being also very apposite to our present subject. The appearance of a stuffed specimen of Musk-Ox, in a decayed state, when the woolly hair is destroyed, is very like a large Gnou in a similar condition, but an immense geographical distance intervenes between them. In the former, high northern latitude bestows its usual woolly covering ; an unknown local cause which deprives several northern animals, and especially the ruminants of the usual length of tail, operates upon the Musk-Ox, and its body is much heavier, and somewhat lower on the limbs than in the Catoblepas.

The generic characters nearly such as they were established by M. De Blainville, are a low compact body, the legs short, not bulky, clean in form, and the feet hairy under the heel, behind the junction of the toes ; the head short ; the forehead broad and flat ; no suborbital sinus ; a muzzle not naked, but the chaffron narrow at the end, very square, and covered with close hair ; the horns common to both sexes, in contact on the summit of the head, flat and broad, then tapering, and turned down against the cheeks, with the points turned up ; the ears short, horizontal, far back ; the eyes small ; the tail short ; mammae two ? hair very abundant, long, and woolly.

The *Musk-Ox*. (*O. Moschatus*.) It would be a pleonasm to repeat the above characters for the species, which hitherto stands alone, in a living state, though there is some reason to suspect that another once existed in the north-east of Asia, and possibly even now may exist in that desolate and extensive region. The Musk-Ox is in size equal to a Guernsey cow ; the hair is brownish-black, occasionally marked with large white blots ; it grows to a very great length, and is composed of a long and soft down, inter-

mixed with straight hairs; the summit of the head of the male is covered by the horns, which form a kind of scalp, in the female it is covered with hair: the legs are generally white, and the hair spreads forward under the heels, so as to cover the greater part of the frog*.

These animals reside to the north-west of Churchill River in Hudson's Bay; living in herds of thirty or forty, the bulls are few in proportion to the cows, caused as it appears by the mortal conflicts among them for the possession of the females; for it is observed that dead males are often found, and that in the rutting season the bulls are so jealous, that they run bellowing at every animal, even ravens, to drive them off. They rut in August, and the females calve about the end of May, never bearing more than one; they prefer mountains and barren grounds, to wooded countries, climb rocks with agility and secure footing; they feed principally on grass; when in season, but mostly on mosses, the tops of pine shoots, and willows. The flesh is flavoured like that of the Elk; the fat clear white, with a tint of azure; but the calves and heifers are the best for the table, the meat of old bulls being so impregnated with a musky smell, as to be very disagreeable food. The genitals of the male are always lubricated with a musky unctuous secretion, which is so powerful as to retain its smell for several years; the dung is in small round kobs like that of the Varying Hare: several thousand weight of the flesh are usually brought frozen by the Indians for winter store to Prince of Wales's Fort. Captain Parry met this species as far north as Melville Island, with the first appearance of the spring; each carcass furnishing him with from three hundred, to three hundred and fifty pounds of beef. It

* The under part of the hoofs and frog, shew a singular softish transversely-ribbed surface, of a brown-red colour, seemingly intended to secure the foot on slippery snow and ice; the outer-toe? is round, and the other crooked and pointed.

descends as far south and west, as the Province of Guivira according to Lopez Gomara, where the Spaniards found sheep as large as a horse, with long hair, short tails, and enormous horns *. Messrs, Hearne, Dobbs, and Graham, have supplied the fullest information relative to this animal, which was first described by Mr. Pennant, though noticed long before by Mr. Jeremie, a French officer, who was stationed in Canada during the succession war.

The *Fossil Musk-Ox*. (*O. Pallantis*.) Mr. Pallas first published an account of heads found on the banks of the Obi, and near Tundra, north of the Arctic circle. One was without the horns, but shewed their base to have extended over the forehead, from the orbits to the occipital crest; another found between the Lena and Indigirska, figured by M. Ozeretkofsky, represents them descending against the temples, behind the orbits, but with such a particular twist, that Baron Cuvier comparing some minor distinctions in the osteological structure of these skulls with those of the American species, appears in doubt whether they be not of a separate species. Though fossil, they have all the characters of recent existence, and the Baron admits with Pallas, the possibility of their reaching Asia, by being conveyed on the field ice. Comparing Captain Parry's figure of the Musk-Ox, with the head represented by M. Ozeretkofsky, the flexures and compression of the horns against the parietals are very similar, but there is, we believe, a difficulty not noticed by the learned Zoologists above mentioned, which is, that if the ice had conveyed the heads in question from America to Asia, that ice could scarcely have ascended the rivers; on the contrary, the river ice must have carried them out to sea: the Bears alone could have conveyed them on shore, but in that case, the remains of carcasses would have been near. We believe all accounts agree in asserting that the currents, along the shores of North and Polar

* See *Purchas's Pilgrims*, book viii. chap. 5.

America, set almost constantly to the eastward, and that from this circumstance the chief obstacles arose, which prevented the success of the endeavours to penetrate towards Behring's Straits from the eastward; hence it might be objected that Asiatic animals might thus be conveyed to the coast of America, but no American to that of Asia.

THE GENUS BOS.

In describing some of the former genera of ruminants, we have occasionally introduced our views of the ostensible physical agents employed by providence, to entice man towards an improved state of existence, and to advance successively from the state of a hunter to a shepherd; foregoing the exclusive use of flesh, meat, and wild fruits, for a more innocent and a more social life. But the possession of the Dog, the Goat, the Sheep, and even the Camel, could not carry him beyond a wandering state of society: influenced by the condition of the pastures and their seasons, he was compelled to change his residence from place to place, until the Ox and the Buffalo being given him, his interests, as well as his inclinations, induced him to fix his abode and commence the cultivation of the soil. Until he had subdued the powers of these bulky animals, all efforts at tillage must have been insignificant, even though, at that early period, he should have been in possession of sundry edible roots, of the *Gom*, of the *Phasis*, and even of some *Tritica*. At first it may be supposed the Bovine race were used only as domesticated grazing creatures; like the Camel, the Ox, may have been a beast of burden, but the essence of his strength lay not in the back: accident or judgment may have led to the discovery that he would draw; lengthened shafts were then attached to his shoulders or horns, at the end of which a kind of sledge, such, probably, as is still used in some parts of Asia, may have been fixed and become the type of the cart and the plough, which, with the pro-

gressive docility of a succession of domesticated generations, produced all the immense consequences upon the civilization, happiness, and increase of mankind which afterwards followed. But the conquest over brute strength, such as the wild species of the genus possess, cannot have been the result of force alone, any more than in the Camel; it is perhaps the natural consequence of that instinct in the calves, of nearly all the species, which impels them to follow the hunter, who has slain its mother, and carries off the carcass; a calf thus obtained, is readily tamed, and there are numerous examples which establish the fact at this day in the American Bison, and even in the Elk.

The genus is distinguished by a strong skull, more or less dense about the frontals, which are variously formed, convex, nearly flat, and even concave; but the horns constantly occupy the summit, and their roots project at first laterally. The osseous nucleus is throughout porous; in the Buffaloes indeed cellular, or according to Mr. Bailly, hollow, and communicating with the olfactory apparatus of the nose. The bony core is covered with a horny sheath, destitute of annuli and striæ; the muzzle is invariably broad and black; there is no suborbital sinus; the ears are mostly middle-sized; the body long, the legs solid. The males have a bellowing voice, some of the females low, others utter a kind of groan. They fight by butting with the head, and kicking with the feet. In threatening the eyes become fiery; they give a low deep roar, stamp, and paw with the feet, and erect the tail. The greater number will submit to domestication; but the quantum of docility varies nearly in the ratio of their strength, and of their sense of feeling; all are offended at the sight of glaring colours, particularly red: they hear and see well, but the sense of smelling is in them the most perfect. The gregarious are capable of a certain degree of education, and even attachment, but the solitary, and such as remain in families,

are the most untractable, and perhaps altogether untameable. All the genus have a musky smell, but none, not even the Bison, is so strongly impregnated with it as the former genus. (*Oribos*.)

The lengthened body and short legs common to the greater part of the genus, indicate that they feed principally on herbs. In a wild state they prefer woody valleys, acclivities, and flats: one species only seeks mountains. Originally, a great geographical distribution seems to have been assigned to the groups of which the genus is composed. The Bubaline sub-genus occupied the warm and tropical regions of the earth; the Bisontine, the elevated, and the Taurine, the lower grounds of the temperate latitudes of the northern hemisphere, quite round the globe. In the deep investigations of Baron Cuvier on the fossil remains of this genus, undeniable proofs are adduced of the existence of the two last named, among the ruins of the earliest mammiferæ of the present superficial system of the earth; probably even of an anterior period, for their remains are found with those of extinct species of the Elephant and Rhinoceros, but in smaller quantity than those of deer. In more recent strata, such principally as the peat beds, others are found more evidently allied to the present domestic species; none, however, of the Buffalo of Africa or of India have been discovered.

THE BUBALINE GROUP.

The name Bubalis, is asserted to have been transferred from the Antelope Bubalis of Authors, before described in our genus *Damalis*, to the animals of the present group, during the sixth century of the Roman empire. It is true, as Buffon maintains, that Aristotle, Pliny, and Oppian did not know the Buffalo by the name of Bubalis; but it cannot be denied that in the age of Martial, this name was vaguely applied even to the Urus, and, consequently, that the vulgar

were already familiarized with it as early as the time of the first Cæsars. Now the Bubalis of Aristotle must have been a rare animal, which certainly bore no such Greek name in its native regions of Central Africa; and therefore the word itself originated, and became common in some other manner. The learned among the ancients, were as liable to misapply appellations of strange animals as the moderns, and the Arachosian Oxen of Aristotle, may have been known to the Greek soldiers of Alexander by another designation; indeed, by the name which, it appears, the Buffalo bore among the northern nations of Central Asia, from the earliest periods, a name which, although it has the sound of a Greek compound, is nevertheless of genuine Touranian origin. It is composed of the syllable *Bu*, Ox, and joined to a distinctive epithet. Taking the Tartaric to be the root, we find that nearly all the dialects of ancient Turan, Cheen, and the posterior Sclavonic, designate both the Buffalo and Bull by the words, *Busan*, Tartaric, *Buka*, *Busum*, *Buja*, *Buha*, *Bucha*, *Buga*, *Bujau*, *Kukan*. *Buwol* is the modern Russian, *Bawol* the Polish, *Buwal* Bohemian, and *Bial*, the Hungarian *. In most of the countries where the above dialects are spoken, the Buffalo is nearly as common as the Domestic Ox, and, moreover, some of these dialects were spoken by the very nations who introduced the animal into Western Asia, Africa, and Europe. It will hardly be asserted that the invaders forgot their own name of a domestic animal, peculiar to themselves, to learn a Greek one which belonged to another; or, that this scientific name, which was not even accepted at Athens or Rome, should have found its way into the heart of Asia, where Greece with its language was not heard of. The

* This list might be considerably lengthened: *Bubaa* is even an Hottentot name of the Common Ox. Bucharica seems to have its name from the Buffalo.

words *Bu*, *βοες*, *Bos*, are all derived from an imitation of the bovine voice ; a primitive mode of designation which is still retained in words of first necessity, among those languages in particular, whose roots can be traced to the earliest periods*. On referring to the Persian names, it will appear that they and the Arabs derived theirs from the word گاو *Gau*, an ox or cow ; thus the Persian گایان *Gayan*, گاوبان *Gawban*, and in particular, گاموس *Gamus*, all names for the Buffalo, and not dissimilar from the Arabic, جاموس *Jamus*, which is probably taken from the Persian, for the other synonyma in that language are all figurative epithets, such as the *Mother of Wealth*, &c. The whole of these bear no evidence of being original, like the Indostane *Bhain*, but seem to be compounds, made when the animal became known to the followers of the Prophet. But those of Upper Asia cannot be charged with the same suspicion, and therefore establish the presumption that the nations who invaded the Roman and Byzantine empires, brought with them the very animal, whose name had reached Europe, perhaps by means of the Greek followers of Seleucian dynasty ; and that the word *Bubalis* is the true name of the Buffalo, as clearly as *Urus* and *Bison* are derived from the Teutonic *Uroks* and *Wizend*.

Aristotle and others, evidently knew the Buffalo *βοες* ἀργιοί ἐν Ἀρχαίωτοις, *Bos Indicus*, or Arachosian Ox : it is described, as differing from the Ox, as the Wild Boar from the Hog, to be black, powerful, with the nose turned up, and the horns bent outwards. In that period the species was not found further west than North-eastern Persia.

* Examples of the kind are numerous in the Greek and Latin ; still more common in the Celtic and Teutonic, and also in Indee. Among the names of animals which are derived from an imitation of their voice, we will only point out the universal *Baa*, *Ber*, *Bahara*, for sheep ; the Indee *Cowal*, a crow ; *Phcal*, a jackall ; *Chi-cel*, a kite, *Holoo*, an owl, &c.

Paul Warnefried, surnamed Diaconus, fixes the appearance of Buffaloes in Italy in the reign of Aigilulf, or the close of the sixth century, that is in the year 596 *; but we may reasonably look for their appearance in the east of Europe to an earlier date. If the myriads of Attila's forces drawn out of Eastern and Central Asia, were supported by droves of cattle bearing grain (buckweed), as is still done with buffaloes in common trade, and by the Nomad equestrian nations, who lead or follow these animals in their native regions, there is no reason for us to conclude that the Arachosian Buffalo was not in their herds; or if it could be proved that the power of the Huns did not extend into the northern provinces of Persia, or Chorasmia, the Abars and Bulgarians † may be regarded as the conductors of that species to the valley of the Danube, Thrace, and Illyricum. This was probably during the reign of Marcian, or about 453, and the posterior introduction of the animals into Italy, might result from causes not connected with the migrations of barbarians.

In Syria and Egypt, they seem not to have been known till after the Arabian conquest of Persia, and their domestication, originating in China or India, is probably far posterior to that of the other species. These two suppositions appear borne out by facts and circumstances, and account for the silence of the Greek writers of the time of Alexander, the ignorance of the old Roman authors, their misapplication of its name to the Urus, and the almost sudden abundance of the species when the Upper Asiatic and the Tartarian tribes had invaded Southern Asia on the one side, and Eastern Europe on the other.

* Tunc, (A.D. 596.) primum, *Bubali*, in Italianam delati, Italiae, populis miracula fuere.—*Paul Warnef.* l. iv. c. 2.

† Here the very name of Bulgar, seems to be a descriptive epithet of a nation of Buffalo drivers, or *Gualahs*, as they would be termed in India.

Hence also the Buffalo is not among the gods of Egypt; but in India, where a similar mythology obtains, we find the Giant Buffalo, *Mahish A'Sura*, representing the great inundation of waters, supplying the type which ancient Egypt found in the Hippopotamus, and Durgas on the Lion, like Horus in Egyptian mythology, piercing him with arrows.

Buffaloes in general are animals of a large stature, resembling a bull, low in proportion to their bulk, and supported by strong and solid limbs. The head is large, the forehead, though narrow, is remarkably strong and convex; the chaffron straight, flat, prolonged, and terminated by a broad muzzle; the horns being flat or bending laterally, with a certain direction to the rear, and therefore not very applicable in goring; the ears are rather large, never erect, funnel-shaped; the eyes large; they have no hunch on the back, but a small dewlap on the breast. The females bear an udder with four mammæ, two of which are sometimes not developed; the tail is long and slender; the back rather straight; the hide black, more or less covered with hair of an ashy or blackish colour; sometimes it is brown or white. They avoid hills, preferring coarse plants of the forest and such as grow in swampy regions, to those of open plains; they love to wallow and lie for hours sunk deep in water; they swim well, or rather float on the surface, and consequently pass the broadest rivers without hesitation; their gait is heavy, and unwieldy, and they run almost always with the nose horizontal, being principally guided by their sense of smelling; but this attitude prevents their seeing beneath them, and conceals their horns. In their combats, they usually strike or butt with the forehead, endeavour to lift the opponent on their horns, and when thrown to crush him with their knees: they trample on the body, and their vindictive fury is so lasting, that they will return again and again to glut their vengeance upon the

same inanimate corpse ; they herd together in small flocks, or live in pairs, but are never strictly gregarious in a wild state ; they have a tenacious memory, and they low in a deep tone. The females bear calves two years following, but remain sterile during the third ; gestation is said to last twelve months, but it appears not to exceed ten ; they propagate at four and a half year's old, and discontinue after twelve. Parturition (in Europe) takes place in the spring, and never exceeds one calf. Dr. Pallas asserts that they breed with domestic cattle, but that the produce usually dies : their life may extend to twenty-five years.

Although in a domestic state they are not remarkable for docility or attachment to their keepers, yet a feeling of this kind, mixed no doubt with instinctive antipathy, is exemplified in an anecdote related by Mr. D. Johnson, " Two Biparies, or carriers of grain and merchandise on the backs of bullocks, were driving a loaded string of these animals from Palamow to Chittrah : when they were come within a few miles of the latter place, a tiger seized on the man in the rear, which was seen by a *guallah* (herdsman), as he was watching his buffaloes grazing : he boldly ran up to the man's assistance, and cut the tiger very severely with his sword ; upon which he dropped the Biparie, and seized the herdsman. The Buffaloes observing it, attacked the tiger, and rescued the herdsman ; they tossed him about from one to the other, and to the best of my recollection killed him. Both the wounded men were brought to me ; the Biparie recovered, and the herdsman died." This anecdote reveals, if not attachment, great antipathy and courage ; and it is well known that neither the Tiger or the Lion are inclined to prey upon the Buffalo, whose vengeance is probably kept alive by occasional depredations upon their young, and Indian herdsmen do not scruple to pass the night in the most dangerous jungle, seated upon the back of some one favourite animal.

Their extreme hostility to red colours is often remarked in India: the same antipathy is observed at the Cape, and in Europe. A general officer, now living, relates, that while a young man, he was employed in surveying in Hungary, and happened to use a small plane table, the back of which was covered with red morocco; as he walked from one station to another, he sometimes carried it with the paper against his breast, and the crimson colour in front. On a sudden, he perceived at a considerable distance a herd of grazing buffaloes throw out signs of defiance, and come down in full gallop towards him with their tails up, and evincing the most tumultuous frenzy. Not suspecting the cause, he paused and dropped his hand, when the whole troop stopped and looked about, as if at a loss; he went on, and unconsciously raising the table again, brought the red colours in sight. They set off a second time towards him, but guessing the cause, he turned the obnoxious colours towards his body, and was suffered to proceed unmolested.

The Cape Buffalo. (B. Caffer.) This species is designated among the Hottentots by the name of Qu'araho. It is distinguished by dark and rugous horns spreading horizontally over the summit of the head in the shape of a scalp, with the beams bent down laterally, and the points turned up. They are from eight to ten inches broad at the base, and divided only by a slight groove, dark coloured, extremely ponderous, cellular near the root, and five feet long, measured from tip to tip along the curves. The incisor teeth are almost always loose in the gums of the adult animal whose height is about five feet six inches at the shoulder and the length from nose to tail, about nine feet; the legs are short and strongly knit; the dewlap is rather considerable; the ears large, hanging open; on each side of the chin and nether jaw, there is a beard of stiff hairs; the hide extremely thick, hard and black, almost naked in old



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animals, and the tail quite naked, excepting some distichous hairs at the end. In younger beasts, a scattered brown hair covers the neck, back, and flly; and in the young heifer, the colour is brown-black, the hair more abundant, and a sort of standing mane four inches long, spreads from behind the horns, along the neck, down the spine to the tail, darker than the rest of the hair, almost black. At that age, the horns are only six inches long, thirteen inches distant from tip to tip, pale in colour, originating at the side of the frontal crest, and rising obliquely upwards, with some slight indication of wrinkles. The forehead and nuchæ are covered with loose black hair, as also the throat, dewlap, and top of the tail; the shin bones and pasterns furnished with curling woolly dark hair. The head is one foot long, and the length of the animal, from nose to tail, five feet seven inches, the tail one foot. At that age, there is so great a dissimilarity from the adult, as to give it the appearance of a different species, for which, indeed, it was taken in the specimen of Mr. Burchell, had not a note within the skin established the species.

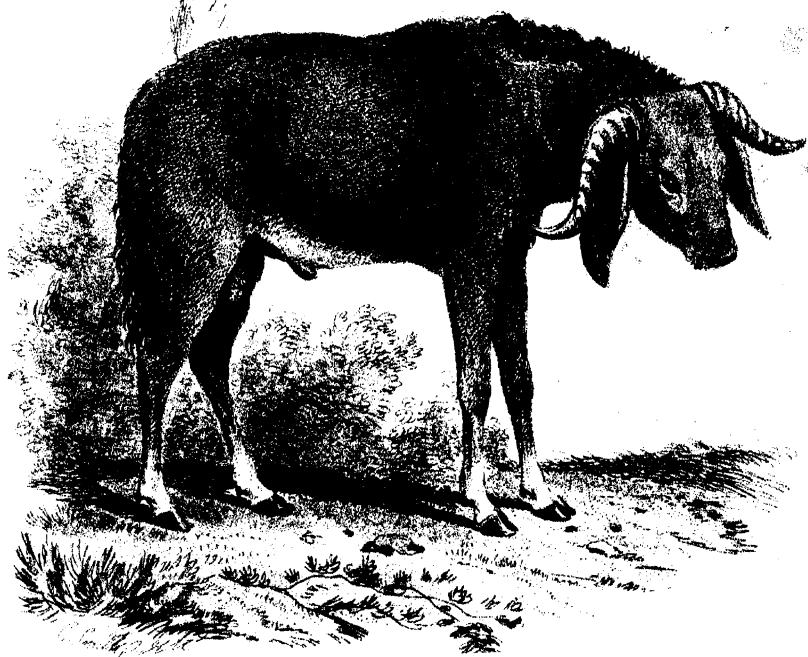
There is some doubt whether Pliny alludes to this species in his description of the fierce African wild oxen which were caught in pit falls*: the Araho is truly a terrible and ferocious beast, possessed of a tremendous bellowing voice, and moving with considerable swiftness, but so ponderous as to be disinclined to ascend; its scent is keen, but the breadth of the horns impede its sight. This species of buffalo lives in families or small herds in the brushwood and open forests of Caffraria, occasionally uniting in droves upon the plain. Old bulls are often met

* He gives it blue eyes, and rufous hair. Chap. xxi. l. viii., but it seems confounded with a species of Bison. If Captain Clapperton's notice be referred to *B. Caffer*, it is found also in Borneo, under the name of Zamouse, the Arabic *Yamus*.

alone, but though these are, if possible, still fiercer than the younger: they are less dangerous, because less swift or inclined to exertion. In the woods, they make paths for themselves, where it is extremely dangerous to fall in with them. Professor Thunberg gives an appalling account of the destruction of two horses by one of these animals, the riders providentially escaping by climbing trees, and the professor himself driven to the same expedient, though his horse remained unhurt, owing to the buffalo turning into the wood. Sparmann, who first fully described this species, is no less animated in the dangerous hunting exploits he witnessed.

• They are excited to madness by the sight of red colour, and swim with great force. The hide is made into shields, cut into whips and traces, and is so hard that a musket ball will scarcely penetrate it, unless the lead be mixed with tin. If this animal could be rendered tractable, it would make the most powerful in agriculture existing. Since the increase of the settlements about the Cape of Good Hope, the Buffalo is become more scarce in the colony, but they spread along the eastern side of Africa to an unknown distance in the interior.

The *Pagasse*. (*B. Pegasus*.) The names of Pacasse of Gallini and Carli, Empaguessa of Merolla, Empacasse of Lopes and Marmol, indicate an animal, presumed to be a species of Buffalo, but not described with sufficient precision to be admitted into the catalogues of nomenclators. The word is evidently of great antiquity and extent, as may be gathered from Pliny, although at present banished from the regions where the Arabic has usurped the ancient language, and confined to the regions of Angola and Congo, where it is coupled with the generic name *Em* or *En*, denoting a Bovine animal. Thus Engamba a cow, Empalanga another large ruminant which is conjectured to be the Tackhaitze of Daniell; and Em-pacasse.



Pliny relates that Æthiopia produces winged horses, armed with horns named Pegasi. Fathers Gallini and Carli observe that, "On the road to Loando in the kingdom of Congo, they saw two Pacasses, which are animals very similar to buffaloes, roaring like lions; the male and female being always together. They are white with rufous and black spots; *with ears half a yard in length*, and the horns always straight. When they see human beings they do not flee, nor do they harm, but stand and look on." Lopes describes them as somewhat less than an ox, but similar in head and neck. Dapper reports them to be buffaloes of a reddish colour with long horns.

These testimonies are very vague, but still indicate one and the same animal, partially misrepresented. To these accounts might be added the notice of Captain Lyons respecting the Wadan, "a fierce buffalo, the size of an ass, having large tufts of hair on the shoulders, and very long heavy horns." This Arabic name seems derived from *waad*, braying or bellowing like a young camel, and may coincide with Carli's account of the roar of Pacasse and the tufted hair on the shoulders be no unapt representation of Pliny's pretended wings of his Pegasus; but no place would have been deservedly given to these observations in this work, if, in the collection of drawings formerly the property of Prince John Maurice of Nassau, now in the Berlin library, there was not among the number of zoological subjects of Brazil, several of Angola, such as sheep and an African elephant, which latter cannot have been executed from a specimen in America. The sheep also have their Congo and Angola names, and it may be fairly conjectured, that the prince during his command in Brazil, had an artist on the African coast, from whence, at that time, slaves were beginning to be abundantly transported to the Dutch settlements. Among these, is a figure of a ruminant with

the name Pacasse written under it*. Judging from the general appearance of the painting, it represents a young animal, although the horns are already about as long as the head. They are of a darkish colour, with something like ridges passing transversely, commencing at the sides of the frontal ridge, turned down and outwards with the points slightly upwards; the head is short, thick, abrupt at the nose; the forehead wide; the eyes large and full, dark, with a crimson canthus; the neck maned with a dense and rough mane; the tail descending below the hough, entirely covered with dark long hair, appearing woolly; the carcass short, and the legs high and clumsy; but the most remarkable character appears to consist in pendulous ears, nearly as long as the head. The mane and tail are dark; the head, neck, body, and limbs, dark brown, excepting the pastern joints, which are white: this figure cannot be referred to a known species, and is sufficiently curious to merit an engraving. If it should appear to be a different animal from Pacasse, it may still represent a new species of buffalo, or, perhaps, of *Catoblepas* or of *Ovis*.

The *Arnee*. (*B. Arni*.) India and China are the native regions of another group of true buffaloes, both wild and tame, which Baron Cuvier's investigations refer to one species, divided into mere varieties. It would be presumptuous to reject conclusions drawn from comparative observations of the osteological structure of the heads by the first authority living; but we think it, nevertheless, interesting to offer the result of our inquiries from a number of military and civil officers, who have long resided and repeatedly hunted the buffalo in various parts of India. It appears that the Wild Buffalo in the central districts of Bengal, is commonly named *Arnee* or *Arnaa*, and distinguished by the

* The notes in this collection are written by three hands, the Prince's, Markgrave's and Piso's; I believe in this instance, that the name is written by the first.

lunate form of the horns and black colour; while the second sort, usually but not always domestic, is known by the appellation of *Bhain* or Byne. Of this sort, the horns are much shorter, bent back towards the neck with the points turned upwards: thus constructed, their arms are but indifferent instruments of attack, and serve only to lift, while in the former they are invariably used for goring. But neither of these are the Gigantic, or Taurelephant Arnee, which appears to be a rare species, only found single, or in small families, in the upper eastern provinces and forests at the foot of Himalaya, though formerly met in the Rhamghur districts. It is probably the same which the Mugs and Burmas name Phang, and consider next to the tiger the most dangerous and fiercest animal of their forests. A party of officers of the British cavalry, stationed in the north of Bengal, went on a three months' hunting expedition to the eastward, and destroyed in that time forty-two tigers, but only one Arnee, though numerous wild buffaloes became their quarry. When the head of this specimen rested perpendicular on the ground, it required the outstretched arms of a man to hold the points of the horns. These are described as angular, with the broadest side to the rear, the two others anterior and inferior, wrinkled, brownish, standing outwards, not bent back, straight for near two-thirds of their length, then curving inwards with the tips rather back: the face is nearly straight, and the breadth of the forehead is carried down with little diminution to the foremost grinder. The best figure we are assured, is in Captain Williamson's *Oriental Field Sports*.

Our own researches, both abroad and in England, have always found skulls, not of this, but of the Common Arnee of Bengal, such as are figured in Shaw, and in the *Ossements Fossiles*, excepting a pair of horns in the British museum, which correspond with those before noticed, and

may be of the true or Great Arnee. Each measures along the curve from base to tip, six feet three inches; circumference, at base, eighteen inches. They are subtrigonal; anterior face, seven inches and a quarter; external face, three inches and a quarter, and posterior face, seven inches and a half. Wrinkled throughout, with one great sweep, neither bending backward or forward, but uncinating; smooth and sharp at the point*. All other heads and horns referred to Arnee in Baron Cuvier's plates, in the Paris Museum, in the British, and in the Royal College of Surgeons, have the acute angular side of the horns rounded; the curves are regular semi-circles, besides a backward bend at base, and the tips turned forward; the largest not attaining five feet along the curves. The true Arnee, is said, besides to be entirely covered with black hair, to have a white epidermis, and a tail scarce reaching to the houghs. In his movements, the nose is not carried horizontally, but so that the horns always remain conspicuous. These observations shew at least, that further inquiries are necessary, and that every buffalo with large horns may, in Bengal, obtain the name of Arnee without, therefore, being the gigantic species which should be understood by it; that is, the black haired, long horned animal near seven feet high at the shoulders.

Captain Williamson evidently speaks of the true Arnee in the anecdote, where one of these animals pursued a sportsman to his elephant, and ran its horns under his belly to lift him up. This individual was killed, and was upwards of six feet high at the shoulder, nearly three feet in breadth at the breast, and the horns five feet and a half long.

* This is our measure, as they are at present, appearing partly broke at bottom, and having, in a former measurement, six feet six inches and a half, weighing twenty-nine pounds without the bony cores.

The other or Common Arnee is also a very large animal, though nearly a foot lower at the shoulders than that last mentioned. It is not much less in weight; the head is smaller, the body longer, the tail reaching to near the heels, and the hide more scantily covered with hair. These are much more common, live gregariously in woody swamps or plains, occasionally floating in whole droves down the Ganges, seemingly asleep, until the current lands them on some island, or on the bank: boats are sometimes endangered by sailing in among them unawares. They are said to plunge under water, and raise aquatic plants with their horn to the surface, where they feed on them, while driving with the stream. An animal of this kind drifted down to near Shaugur Island, in 1790, and was shot by the crew of the Hawkesbury Indiaman, towed alongside, and hoisted in; the meat weighed three hundred and sixty pounds per quarter, exclusive of the head, legs, hide, and entrails, and the whole could therefore, be scarcely less than two thousand pound, though the ship's butcher pronounced it not above two years old.

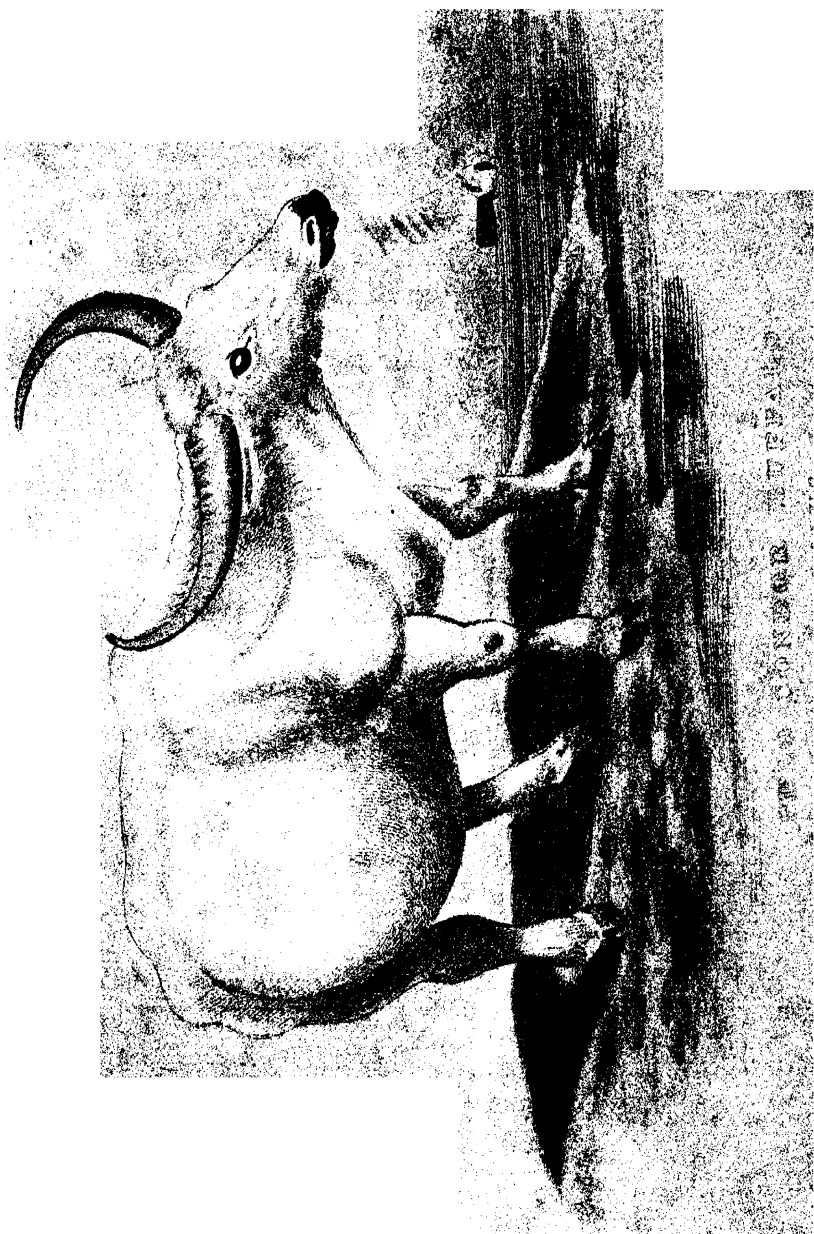
A herd of these animals was observed by a column of troops, some years ago, on the march to Patna, by the inland road. On discovering the red dresses of the soldiers, they threw out their usual signals of hostility, and galloped off; then suddenly wheeling round, came in a body, as if they intended to charge, and their horns overtopping the heads, rendered it doubtful whether they were not mounted by some hostile force; part of the column, therefore, halted and formed, and the animals suddenly struck by the glittering of the arms, stopped, turned tumultuously round, and dashed into cover*.

These anecdotes shew the scepticism of some continental naturalists, respecting the existence of wild buffaloes in

* It is not impossible, that more than one species is confounded under the name Arnee, and that even the genuine *Urus* of the Ancients, still exists in the remote temperate forests of Asia.

India, to be quite misplaced. Formerly, this race was occasionally reduced to a precarious domesticity, by order, and for the amusement of, the native princes; but now they use the largest of the domestic breeds: these are mounted by their keepers and brought into the Arena to engage in battle with the Tiger, who is almost invariably defeated. The race of the Common Arnee is also, it would appear, domesticated in the eastern states: a white variety is found in Tinean, and other islands of the Indian Archipelago. On the coast of Cochin China, and the Maylayan Peninsula this race appears to predominate: they are of very great bulk, with the horns, when seen in front, forming a true crescent; their skulls are the usual Arnees of European Museums. Although the skin of the white variety be rosy, the muzzle and edge of the lips are yet black, the eyes are large and dark, the snout longer and narrower than in the black-skinned Buffalo, and their height at the shoulder is not five feet, owing to the legs being short. Those of Siam, both wild and domesticated, are ashy gray, larger than an ox, the muzzle much prolonged, and the horns very long forming a crescent above the head. This variety has a shrill weak voice, and the domesticated are more easily managed by children, than by grown men.

The *Domestic Buffalo*. (*B. Bubalus*.) Whether or not the Arnee of Bengal be the stock from which the Domestic Buffalo is descended, certain it is that the species now under consideration, is still found in a wild state, as well as domesticated, and that in all countries, sufficiently uninhabited and affording the requisite conditions, the black-skinned domestic animal will soon supply a wild breed. This occurs whenever local circumstances are favourable, even in the kingdom of Naples, and we might draw an inference from this fact alone, that the species with crescent horns, are distinct from the present, although both have breeds which have received the yoke of man; nor if it were proved that a prolific intermediate race exist, produced by



the intermixture of both, would it fully determine that both form only one original species. What forms a species, and what a variety, is, as yet, far from well understood.

The Bhain of India may be regarded as the true stock of the Domestic Buffaloes of Southern and Western Asia, North Africa, and Eastern Europe. Little doubt can be raised, that in India that animal was first subdued, perhaps, by means of the intelligence and powers of the Elephant, who alone could compel it to subjection; from thence, commerce or remote military expeditions seem to have introduced it into Tartary and Eastern Persia, till by either of these means the Domestic Buffalo was found on the shores of the Caspian. Here they resided at the time of the Macedonian invasion, though the Tartars seem to have used their Busan as beasts of burden, at least, as early, and about that period, or soon after, to have led them to the banks of the Tereck. They were found by the Mahomedan Arabs in Persia, and during their wars brought westward into Syria, and Egypt. Baron Cuvier, with his accustomed research, proves the pilgrims and writers concerning Palestine to have noticed them by the name of Buflus, early in the eighth century, and we have already seen at what period they reached Italy.

The stature of the Buffalo varies according to the circumstances of food and climate. The Hungarian and Italian are about eight feet and a half long, by five feet at the shoulder; the horns are directed sideways, compressed, with a ridge in front, reclining towards the neck and the tips turned up, placed at a great distance from each other, with a convex forehead between them; the mammae of the male placed in a transverse line; the hair scattered, coarse, and black, and the tail long, terminated by a tuft; the hide is of a purplish black, in India almost naked, in Egypt, sometimes totally without hair, and in the Indian Archipelago the anterior half is occasionally covered with

long hair, and the posterior naked ; it varies also to rufous, and white occurs in some breeds.

It is an animal at all times of very doubtful docility, with a sombre malignant eye ; active, daring, swift, and persevering when excited ; dull, slow, wallowing in his ordinary state ; naturally preferring flats and swampy soil ; possessed of great strength for burden, and for the plough, two being equal in power to four horses ; but furnishing little, and indifferent milk and worse flesh : the hide and horns are alone valuable. In India, however, they furnish more milk from which a kind of liquid butter is made, well known by the name of *ghee*. The domestic breed, in Bengal, is not more than four feet and a half high, and used to labour ; but for burden, care must be taken that the goods they carry do not suffer from wet, their propensity to lie down in water being invincible ; wood and bricks are, therefore, the most common load. The largest of the wild breed, are used by the native princes, to supply the place of Arnees, and fight with tigers in public shows. With the natives, especially the Guallah cast, or herdsmen, they are docile ; they ride on their favourites, and spend the night with them in the midst of jungles and forests, without fear of wild beasts. When driven along, the herds keep close together, so that the driver, if necessary, walks from the back of one to the other, perfectly at his convenience. The females are dangerous, while they nurse their calf. In Italy, it is asserted that Buffaloes are again become wild ; the domestic, however, both there and in Hungary, are managed by means of a ring passed through the cartilage of the nose : in India, it is a mere rope. The practice is ancient, and it would seem that the Slavonic *Wenden*, brought Buffaloes with them to the shores of the Baltic, if we may judge from the armorial bearings of provinces and families, not unfrequent in the North of Germany and Switzerland ; unless we prefer to believe that the *Urus* or parent of the

Domestic Ox, required to be ringed for many generations before it became tractable.

A small variety noticed by Mr. Pennant was brought from the Indian Islands. It was not larger than a runt, with a nearly naked skin, the hair being bristly and rather long on the neck and shoulders, and the rump and thighs quite bare, with a few dusky stripes. The horns compressed sideways, taper and sharp at the points; the inside and tips of the ears, and the lips, white.

Comparing our series of drawings taken from living specimens of the Hungarian, Italian, Indian, and dwarf varieties, no doubt remains of their identity; but the same certainty does not attach to those described as Arnees with the lunated horns, though of that race the domestic breeds of China, furthest India, and the Archipelago, are mostly composed.

THE BISONTINE GROUP.

If the elevated ridge of the spine on the shoulders, long legs, a woolly fur, and the residence in mountain forests, approach the Bisons nearer the Damaline and Catoblepine genera than the Buffaloes, this group should take place of them and be the first of the genus *Bos*. In this group are found indications of an ancient and colossal species existing at one time in Europe and Northern Asia, and even in America, attested by the repeated discovery of enormous skulls in the diluvian strata of the earth, on the vegetable mould, and even beneath them, among the remains of the Mastadon and Rhinoceros. But there seem to be fossil remains of two different epochs; the first or deepest belonging to the colossal, and the second perhaps to the existing Aurochs, or, to speak more correctly, Bison. In order to establish this group upon a clear foundation, and separate it from the Urus and domestic species with which it has long been confounded, it is necessary to repeat the

luminous view which Baron Cuvier furnishes on the subject. He says " the forehead of the Ox is flat and even slightly concave; that of the Aurochs (Bison) is arched, though somewhat less than in the Buffalo: it is in the Ox nearly equal in height and breadth, taking the base between the orbits; in the Aurochs, measured in the same place, the breadth greatly surpasses the height, in the proportion of three to two: the horns of the Ox are attached to the extremity of the highest salient line of the head; that which separates the forehead from the occiput: in the Aurochs this line is two inches behind the root of the horns: the plane of the occiput forms an acute angle with the forehead in the Ox; that angle is obtuse in the Aurochs: finally, that plane of the occiput quadrangular in the Ox, is semicircular in the Aurochs.

These characters are constant in all the varieties deriving from the Ox, including those with hunched backs: besides, the Bison has fourteen pair of ribs, while the Ox, in common with most ruminants, numbers only thirteen pair: the legs are more slender than those of the Ox or Buffalo, and the tongue is blue, while the Ox has it flesh colour. Mr. Gilibert who reared an individual, naming the species by its true appellation, represents the hair of the female Bison as soft, placed in the skin at an obtuse angle: of two sorts one long and the other soft; while those of the Cow are of one kind, hard and close to the hide. Those of the male Bison are very long under the jaw and throat, and upon the shoulders and upper arms; also upon the back, but less prominent: the tail descends to the houghs, and is provided with abundance of long black hair; the summit of the head is covered with a bushy and spreading space of long hairs, strongly impregnated with musk; and the horns are short, lateral, black, and pointed: the eyes large, round, and full. The back part of the body is covered with shorter

hair, which also predominates in summer on the shoulders. The hide is double in thickness to that of the Ox, and the species shews a decided aversion to domestic cattle.

The name Aurochs, applied to the Bison by the Germans, is evidently the origin of the Latin *Urus*; but Baron Cuvier, following up with his usual research the observations of Herberstein, establishes beyond a doubt, that the true *Urus* may still have existed in some parts of Massovia by the name of *Thur* in the time of the last-mentioned author, but that it is now extinct in Europe and Western Asia, and its name transferred to the Bison of the Ancients, which the Poles at this day still distinguish by the appellation of *Zubr*, and the ancient Germans called *Wizend* and *Bisam* (Musk). The Baron explains the causes which have misled naturalists, and caused them to overlook the Bison in the *Bonasmus*, *Bolanthus*, *Monepus*, *Monapus*, and the *Pæonian Oxen* of Aristotle and Pliny, who clearly distinguishes the maned Bison from the rapid *Urus*, and Seneca still more distinctly says,

Tibi dant variæ pectora tigris
Tibi villosi terga Bisontes
Latisque feri cornibus Uri.

Pausanias and Oppian both represent the Bison as very hairy about the neck and breast, place it in *Pæonia* and *Thrace*, and repeat almost the very words which Aristotle uses for the *Bonasmus*.

But the Bisons of Europe are not the only species of the group; for, beside the American, Asia, in all probability, contains two more. All appear to live in small families, which assemble into herds only in certain seasons: those of the Old World prefer woods and mountains. In America, from causes probably local, they are mostly found on open elevated plains or savannas. Notwithstanding the hostility between the Bison and the Ox, it is asserted that in America, the males often drive the Bull from the Cows, and

cover them, and that the intermediate animal is prolific. Our inquiries on the spot never produced a proof, or even an assertion, from the well-informed, that they had seen the hybrid offspring.

The *Bison*. (*B. Bison*.) The animal commonly known by the names of Aurochs and Zubr is, as before explained, the true Bison of the Ancients. It is distinguished by an elevated stature, measuring six feet at the shoulder, and ten feet three inches from the nose to the tail. In adult specimens the withers are elevated, but when old they do not appear so, nor are they conspicuous in the females. The head is broad, and the horns far distant, short, robust, pointed, slightly turned forwards, and dark-coloured; the forehead is arched; the eye large, full, and dark; the body is formed with fourteen pair of ribs; the mammæ are four, disposed in a square; the anterior half of the animal, with the exception of the chaffron, is covered with a heavy coat of mixed woolly and long harder hair measuring more than a foot in winter; the internal parts of the woolly, is gray or whitish, as also in general that on the top of the head, throat, and breast; the external browner on the throat and breast, abundant and bearded; the lower extremities, back, flanks, and croup, short haired, of a brownish-black colour. The females are smaller, with shorter and less hair on the shoulders and throat, and the colour paler.

Mr. Gilibert, who resided a long time in Poland, and reared a female, is the author who dissected and best described this species. As we have observed, it was known to the Ancients, and their bones are often found in the superficial strata of temperate Europe. At present they are nearly destroyed in Lithuania, though they were still common in Germany in the eighth century. They may now be looked upon as residing only in the forests of Southern Russia in Asia, the Carpathian and Caucasian mountain-forests, and the Kobi Desert; but none exist in Siberia. They prefer high

wooded localities to the plain or the low lands, live in small troops, and have a groaning voice. The *Gaw-Kottah* of the Persians is probably this animal.

The *Gaur**. (*B. Gaurus*.) The next in order of this group may be placed a species of Bison, which, from all accounts, appears to be among the largest now living; and although in Indian phraseology the word Buffalo has been used, no doubt can exist respecting the propriety of placing it in this section; indeed the Gaur may be no other than the true Bison, though from certain testimonies we are inclined to regard it as an intermediate species.

In the *Mem. du Mus. d'Hist. Nat.*, vol. ix., a notice was published, purporting to be an extract from an English account of a hunting excursion in the mountains of *Minepont* (Midnapoor?), vaguely indicated as situate one hundred leagues from the sea between the coast of Coromandel and the head of the bay of Bengal, and describing an ox of gigantic stature under the name of Gaour, with the spinous apophyses of the vertebræ of the withers projecting *externally*! One of these was slain, and measured five feet eleven inches nine lines at the shoulders; eleven feet eleven inches nine lines from the nose to the end of the tail, and seven feet seven inches nine lines in circumference. In another specimen the head exhibited nearly all the characters of the Domestic Ox, but the forehead was more arched and raised; the horns, strong and rough, were not bent back as in the Buffalo; the top of the forehead was

* This name of Gaour, or Chau-ur, originating in Central India, shews how far the root *ur*, *urus*, is extended. *Gaur*, a giant; *Ghaur-ur*, the gigantic, ancient, mysterious, terrible Ox: *ur* is sometimes an epithet of the Lion in the east, and of the Bear in the west, and used as the synonyme of the proper name, no doubt because in the primitive root; nobility, generosity, mischief, slaughter, are all secondary significations of *ur*. *Gor* appears mistranslated wild ass in the Schahnamed, where Rostun kills one as large as an elephant.

covered with white woolly hair; the rest of the hair was smooth, close, and shining, of a dark-brown colour, almost black; the eyes were smaller than in the Ox, and pale blue; the muscles of the legs and thighs very prominent and strong. But the most remarkable character of the Gaur, that which should distinguish it from all other ruminants, consists in a series of spinous processes along the back, beginning at the last vertebræ of the neck, shortening gradually till they are lost half way down the spine; the foremost are at least six inches higher than the ridge of the back. These Gaurs live in families of ten or twenty, graze on the meadows, and feed on leaves and buds of trees, the female bears a twelvemonth, and calves in August. Buffaloes fear their presence, and never invade their localities.

There is every appearance of a mistake, or what would be more unpardonable, a hoax, in the description of the spinous vertebræ of the shoulders, which our own inquiries by no means confirm. In Mr. D. Johnson's *Sketches, &c.*, the Gaur is described as a kind of wild bullock of a prodigious size, residing in the Ramghur district, not well known to Europeans. That gentleman continues: "I have never obtained a sight of them, but have often seen the print of their feet, the impression of one of them covering as large a space as a common china plate. According to the account I received from a number of persons, they are much larger than the largest of our oxen; are of a light-brown colour, with short thick horns, and inhabit the thickest covers. They keep together in herds, and a herd of them is always near the Luggo-hill; they are also in the heavy jungles between Ramghur and Nagpoor. I saw the skin of one that had been killed by Rajah Enty Narrain; its exact size I do not recollect, but I well remember that it astonished me, having never seen the skin of any animal so large. Some gentlemen at Chittrah have tried all in their power to procure a calf without success. The She-



carries and villagers are so much afraid of these animals, that they cannot be prevailed on to go near them, or to endeavour to catch any of their young. It is a prevailing opinion in the country, that if they are in the least molested, they will attack the persons disturbing them, and never quit them until they are destroyed, and should they get into a tree, they will remain near it for many days."

We have received similar accounts from other British sportsmen, with the addition that they are more hairy in front than on the back, and that the shoulders are greatly elevated. The tone of colour is said to vary with the seasons, which accords pretty well with other Bisons, who are almost black in winter and sun-burnt to rufous in summer. In the mountainous districts where they reside, there are not at present stations of troops with elephants at their command sufficiently near to go in search of them and clear the jungle; yet, as their residence is well known at Norungabad, their description may be expected at no great distance of time. Although the existence of this animal is more questionable in Africa, yet Pliny's *Æthiopian Bull* with blue eyes* might refer to this species, and even the white variety as large as a camel, known in Madagascar by the name of Bouri, be the same.

The American Bison. (*Bos Americanus*.) This species is commonly known by the name of Buffalo, and was long confounded with the Bison of Europe, though it is anatomically more remote from it, than the Yak, notwithstanding the great external similarity between them. This species is distinguished by small horns, round, lateral,

* Sed atrocissimos habet (Æthiopia) tauros silvestres majores agrestibus velocitate ante omnes, colore fulvos oculis caeruleis pilo in contrarium verso; rictu ad aures dehiscente, juxta cornua mobilia, tergori duritia silicis, omne respuens vulnus, feras omnes venantur; ipsi non aliter quam foveis; capti, feritate semper intereunt.—*Plin.* l. viii. c. 21.

black, very distant, turned sideways and upwards; the height at the shoulder is about five feet, and at the croup four; length from nose to tail eight feet: but these dimensions must be considerably increased in some individuals, being reported sometimes to weigh sixteen hundred and even two thousand pounds. The structure of the animal is heavy in front, meagre and weak behind; the body is long, having fifteen pair of ribs and only four cocci-gian vertebræ; the eyes round and dark; the chaffron short; the forehead broad, and the muzzle wide. Upon the summit of the head there is a vast quantity of long woolly hair, hanging over the face, ears, and horns; the neck is a little arched, and the withers are greatly elevated; upon the face the hair is rather curled, but on the cheeks, throat, neck, shoulders, breast, and upper arms, very long; the back, flanks, croup, thighs, and legs covered with close short hair; the tail, about eighteen inches long, is terminated by a long tuft of coarse hair: the colour in winter is a purplish brown-black, turning rusty by the effects of the sun and weather, so as to become light-brown in summer. The female is smaller, the horns still less, and the quantity of hair on the anterior parts much smaller.

These animals are in the habit of standing with the feet much more under them than domestic cattle, and then they appear as if their body was shorter. They reside in winter as much as possible in the woods of temperate North America, ascending the mountains and penetrating into New Mexico. Towards the summer they migrate northwards, and in their passage both in spring and autumn, occasionally form herds of several thousand. They are not naturally dangerous, but irritable; we have seen them leap over fences four feet high, and defend themselves against bull-dogs with much spirit and more activity than the Domestic Bull: they turn with great quickness, and being covered by their shaggy hair, dogs seldom seize them

firmly. When a dog thus snaps into the hair, they toss him over the head in an instant; and if at length, they are, what is termed, pinned by the nose, they spread the fore-legs, bring the hind feet forward, till they tread the dog under them, and then tear the head loose regardless of the wound they thus inflict upon themselves, provided their enemy be crushed by their feet. They defend themselves against troops of wolves by forming a circle with the strongest outside; a practice which is common to most gregarious ruminants of the northern hemisphere.

About the middle of June the rutting season commences with the most determined battles among the males: they are then not to be approached with safety. Young animals acquire a certain temporary docility, and might be used to the plough; but the elevation of the shoulders, and their weakness about the loins, will never allow such profitable use to be made of them as of the Domestic Ox. The females besides do not retain their milk long, yield a smaller quantity, and it is said to smell musky: they are also very restless, leaping the fences and enticing the other cattle to stray by following them, and damage the corn-fields. We have seen many of these animals, but none that were estimated to weigh more than eight hundred pounds, and suspect the reality of such ponderous individuals as before mentioned, unless they belong to a larger species, said to be found in the interior, and differing somewhat in their form, and much more in their size; though it must be confessed that old bulls, sometimes concealed singly in good pasture, will fatten so enormously as to run with difficulty and fall an easy prey.

Formerly the species was known to the eastward of the Apalachian Mountains, but they are no longer found in the remote parts of Pennsylvania or in Kentucky, and only seen beyond the Mississippi; on the Ohio and Missouri they are in great numbers. The Indians shoot them or

encompass a herd by firing the grass, when a number are destroyed without difficulty. In the northern parts they drive them into a kind of staked avenues, or keddah, while the snow is on the ground, and kill them from a tree in the centre of the recess, and from around it: they make cloaks, &c., of the hides. The Buffalo dance is one of the principal ceremonies of the year among many tribes. It takes place before the hunting season of the Bison, and has been fully described by Pennant.

The *Yak*. (*B. Poëphagus*.) This animal was originally noticed by Ælian under the above name, and since described by Pallas, who preferred as a specific designation *grunniens* or grunting; but it should rather be groaning, as its voice has no similarity with the grunt of a hog. The Yak bears some resemblance to a buffalo in the form of the head; but it is shorter, more convex, and thicker about the muzzle; the ears are wide, horizontal; the eyes large; the muzzle itself small, and the nostrils almost transverse; the lips tumid; the forehead rather flat; the top of the head convex between the ears, and covered with frizzled woolly hair; the neck of the male thick; the withers elevated, but not hunched; the mammæ placed in a transverse line, and the body furnished with fourteen pair of ribs. The hair of the forehead whirls, and is close; that on the neck, back, and sides, is long, woolly, pendent in winter, and upon high mountains, but shorter on the sides in summer, and in low warm situations. From the shoulders along the spine, there is a streak of hair generally grayish, and turned forwards; the tail more furnished with long and finer hairs than in the Horse, reaches to the heels. The stature of the animal varies, the smaller being only seven feet long, and three feet ten inches at the shoulder; but there are larger varieties, the tail of one in the British Museum measuring six feet in length. The horns are round, smooth, pointed, lateral, bending forward and up-

wards, black or white with black tips, or even pure white, and there are some hornless. The colour varies greatly, but in general it is black; but many have their fine tails pure white, as also the ridge on the shoulders, which is abundantly covered with light frizzled hair, that it appears like a hunch; two or four legs are commonly of the same colour, and the line of the back sometimes extends in a broad white streak to the tail: a few have locks of rufous among the white about the shoulders.

Like the rest of the Bisontes, the Yaks are more fond of mountainous woods and valleys, than the open plains, keeping on the south side in winter, and on the north in summer. They are said to be fond of wallowing in water, and to swim well; but to take the water, can only be in the summer heats, and in the countries where their fleece drops. The species is both wild and domesticated, but the latter have still much of the sombre menacing, and down aspect of wild animals, and all their irascibility at the sight of the gay colours. They will attack strangers, or at least throw out signals of hostility, stamping with the feet, whisking their tails aloft and tossing the head: they are active in running and climbing. The mountains of Bhotan and Thibet offer the principal asylum to the wild species, where they appear to enjoy the vicinity of the snow; but they are also domesticated in that country, spreading from thence over a great part of China, and even to Central India, where they seem to be without woolly hair, but still marked by the white feet. We are inclined to consider the *white* species of wild cattle in the Ramghur Mountains as a variety of this species; for a country which includes the course of the Ganges from beyond the Himalaya range to the sea, contains every degree of climate, and may, therefore, well be supposed to mark also its various impressions upon animals, to the two extremes of which their nature is capable; and the practice of the

Braminical cast, to give liberty to certain cattle at their deaths, may produce great differences upon animals, who are thus restored to a state of nature. The Yak inhabits also the Altaic Mountains, and supplies milk to the Calmuks, the Mongolian and Doukta Tartars, and affords materials of trade in the sale of their white tails, of which the Turks and Persians make standards, commonly named horse tails, dyed of various colours, but principally crimson. In India and Persia, *chowries* or fly-drivers are made of them, and they adorn the ears of elephants, the throat, band, and croups of horses, as may be seen to have constituted a practice of antiquity in the bas reliefs of Chelminar (Persepolis) and Naktchi Roustam, the temple of Salsette, and is still in vogue at this day. The Tartars lead a wandering life with these cattle, preserving the milk, which is very good and abundant, in bladders, till they load the animals with their own produce, and carry it to market: they make tents and ropes of the hair; caps and and clothes of the skin. The Chinese name them Si-nyn or Water Ox, and adorn their caps with the fringes of the hair. The Tartar name is Sarlyk Ukur; the Mahomedan, Ghau-n'ouk. In India the Yak is called Soorgoy; and the Persians seem to indicate it by گاو دشتی *Gaw-dashti*.

The *Gayal*. (*B. Garæus*.) If the *Guavera* of Ceylon be the same animal as the *Gayal* of India, the species was known from the time Knox wrote his history, but was little noticed by naturalists, until Mr. Pennant extracted from this work his account of it, and Mr. Brooke Lambert subsequently described a specimen, which lived a short time in England. Captain Turner also had noticed it, and lately Mr. F. Cuvier figured the Jungli Ghau. There existed a paper on the *Gayal* in the second volume of the *Asiatic Researches*; but in the Eighth, 1808, a more complete description is produced through the communications of Drs. Roxburgh, Buchannan, Messrs. Colebrook, Macray, Bird



THE CATTLE

OF THE CATTLE

and Dick, gentlemen stationed in various parts of India, and having the means to extend their inquiries.

From these accounts, it appears that the Gayal is nearly the size and shape of an English Bull, with a dull heavy appearance; but at the same time, of a form equal in strength and activity with the Wild Buffalo. It has short horns, which are distant at the bases, and rise in a gentle curve directly out and up. The head at the upper part is very broad and flat, and contracted suddenly towards the nose, which is naked like that of the Common Cow; from the upper angles of the forehead, proceed two thick, short, horizontal processes of bone, which are covered with a tuft of lighter-coloured hair: on these are placed the horns, shorter than the head, and lying nearly on the plane of the forehead; at the base they are very thick, and slightly compressed, the flat sides being towards the front and tail; the edge next the ear is rather the thinnest, so that a transverse section would be somewhat ovate; towards their tips, they are rounded, and end in a sharp point. The eyes resemble those of a Common Ox, the ears much longer, broader, and blunter than those of that animal; the neck is very slender near the head, at some distance from which a dewlap commences; but this is not so deep, nor so much undulated as in the Zebu. The dewlap is covered with strong longish hair, so as to join a kind of mane on the lower part of the neck; but is not very conspicuous, especially when the animal is young.

In the place of the hump, the Gayal has a sharp ridge, which commences on the hinder part of the neck, slopes gradually up till it comes over the shoulder joints, then runs horizontally almost a third part of the back, where it terminates with a very sudden slope. The height of this ridge makes the neck appear much depressed, and also adds greatly to the clumsiness of the chest, which although narrow is very deep; the sternum is covered by a continua-

tion of the dewlap ; the belly is protuberant, but in its hinder part, is greatly contracted ; the rump, or *os sacrum*, has a more considerable declivity than that of the European Ox, but less than that of the Zebu. The tail is covered with short hair, except near the end, where it is tufted, but descends no lower than the shins. The legs, especially the fore ones, are thick and clumsy ; the false hoofs are much larger than those of the Zebu ; the hinder parts are weaker in proportion than the forehead ; and owing to the construction of the belly, the hinder legs, although, in fact, the shortest, appear to be the longest.

The whole body is covered with a coat of short hair : from the summit of the head, there diverges, with a whirl, a bunch of rather long coarse hair, which lies flat, is usually white or lighter-coloured than the rest, and extends towards the horns and over the forehead. The general colour is brown in various shades, which very often approaches to black, but sometimes is rather light ; the legs and belly are usually white, as also the tip of the tail.

The head is about one foot eight inches long, and the distance between the roots of the horns ten inches ; total length from nose to tail about nine feet six inches ; height at the shoulders, four feet nine or ten inches ; height at the loins, four feet four or five inches. Circumference of the chest six feet seven inches ; circumference of the loins five feet ten inches ; length of the horns, one foot two inches ; length of ears, ten inches.

The voice of the Gayal has no resemblance to the grunt of the Indian Ox ; it is a kind of lowing but shriller, and not near so loud as that of the European Ox, but resembling it more than the Buffalo's. The Cucis or Lunctas, a people inhabiting the hills to the eastward of Chayaon, (Chitagong) have herds of the Gayal in a domestic state, from time immemorial, and without any variation in their appearance from the wild stock : no difference whatever

being observable in the colour, both having the same variations of the brown shades ; nor in their stature, both being bred in nearly the same habits of freedom, on the same food, and the domestic not undergoing any labour. By them it is called Shial, from which, most probably, its name of Gayal. It is possible that the wild cattle of Siam, who use their terrible horns with great success against the Tiger, noticed by Colonel Syms under the name Catin, are of this species.

Gayals never descend to the plain of their own accord, residing in Tipura, Silhet, and Chatgaon, Bhotou, and Cath-har, west of Manipus. They are little known beyond the Burrampootra. The Mugs name them J'hongnuah, and the Burmas, Nunel. In the *Hindoo Sastras* they are called Gobay, As'l Gayal, and Seloc by the Cucis of Chatgaon, who hunt them for their flesh. They have a full eye, but are subject to blindness in old age ; in disposition rather gentle, even in a wild state not being considered dangerous. They delight to range in the thickest forests, browsing evening and morning on tender shoots and shrubs, seldom feeding on grass, retiring to the mountain shade to ruminate, and never wallowing in water ; they live from fifteen to twenty-six years ; at five years old they are nearly adult : at three years the female receives the bull, and goes eleven months. The milk is not abundant nor lasting, but very rich. The Hindoos will not kill the Gayal or Gobay, which they hold in equal veneration with the Cow, and quote the *Sastra* : “ Gosadrisha, Govayah,” a Govay is like an ox, from whence their casuists infer that it is not an ox ; still they are occasionally sacrificed by some sects to the hill-gods. *Go*, an ox or bull ; *viana*, wild, are stated to be the root of Govaya.

Mr. Bird afforded from Dacca decisive information respecting their breeding with the Indian bull. “ Having brought a domesticated female Gayal from Chittagong to

that place, and not being able to procure a male Gayal at Dacca, he directed a common bull of the Deswali breed, or Common Zebu, to be presented to her, which the female received upon being blinded by a cloth thrown over the eyes. The issue was a cow, resembling mostly the Gayal mother; and from that cow, impregnated by a bull of the same common breed, another cow was produced, which also had grown up, and was in calf by a common bull at the date of the letter."

The Gauvera of Ceylon is likewise a wild ox, dark coloured, with a high ridge on the shoulders, and white feet; it resides in the woods of the interior, and has been shot by British parties during the war in Candy. These animals appear to form but one intermediate species, between the Bison and the true taurine group, with which it might perhaps be arranged with greater propriety.

Beside the above existing species, it may be proper to mention the fossil Bisous.

The *Broad-headed Fossil Bison* (*B. Latifrons*) of Dr. Harlan, is described by Baron Cuvier. The skull differs little from that of the Bison, except in its greater dimensions; the forehead is arched, broader than high; the horns are attached two inches before the line formed by the union of the facial and occipital surfaces, which latter form an obtuse angle; the plane of the occiput represents a semi-circle; the horn is twenty-one inches in circumference at its base; a fragment of this size was found in Kentucky, and similar skulls were discovered near Melnick in Bohemia, in Italy, and on the Rhine, in Russia, Siberia, and probably over the whole northern hemisphere.

The *Bos Bombifrons* of the same American author is described by Mr. Wistar from a skull presented by Mr. Jefferson to the American Philosophical Society. The top of the head between the horns is strongly arched and projecting; facial line forming rather an acute angle, with the oc-

cipital surface; horns first projecting laterally from the sides of the head, then curving downwards: they are placed on the skull at a considerable distance anterior to the union of the facial and occipital surfaces. The specimen, injured, and wanting the face and jaws, was found in Big-bonelik, near the falls of Ohio. The affinity seems to be nearest to the Tartaric Yak.

THE TAURINE GROUP.

We have now reached the last group of ruminating animals, that which constitutes the most useful and important gift to man in a social state. The immense advantages derived from the domesticated Ox in the beginning of human civilization, may be gathered from the conspicuous part its name and attributes perform in the early history of mankind. We find the Bull among the signs of the zodiac; it typifies the sun in more than one system of mythology; the supreme power as Jupiter among the Greek and Roman; the strength of war with Mars; the sinews of commerce with Mercury, but still typifying the sun; the Dolichenus among the Sequanian Gauls. The Bull was personally worshipped by the names of Apis and Mnevis among the Egyptians, and is still venerated in India. The Cow is repeatedly a mystical type of the earth in the systems of ancient Greece, or a form of Bhavani with the Hindoos, and still more marked in the lunar arkite worship of the Celtic nations. The Hindu Vedas consider it as the primordial animal, the first created by the three kinds of gods, who were directed by the supreme Lord to furnish the earth with animated beings. The Ox first enabling man to till the ground, was a direct cause of private territorial property and of its consequences, wealth*, com-

* Hence the Ox stamped upon the money of Attica; hence the Cow is a representative of money in ancient Irish transactions.

merce, leisure, and learning ; he was no less the means of abstracting mankind from the necessity of shedding blood, and thus he became the emblem of justice, the vehicle of Siva. This merited consideration we see dexterously used by ancient legislators to soften the brutality of human manners, either by forbidding the flesh as food in those countries where his acknowledged utility was counteracted by obstacles in the increase, or by commanding the frequent use of sacrifices by a proper slaughter, and where *fire and salt* should be employed, to check a horrid species of massacre and practice of devouring the flesh in a raw state. Such are the meaning of the prohibitions in Deuteronomy ; and the necessity of these prohibitions is but too manifest in the ancient allusions of Orpheus which inculcate that principle, when we find Julius Firmicus, many ages after, reproaching the civilized Greeks with perpetrating these horrid repasts in their Dionisiacs : “ Vivum laniant dentibus taurum ;” and again, “ Alter, cruentus ore, dum viva pecoris membra discerpit ;” which evidently mean the brutal repast still practised in Abyssinia, for which the veracity of Bruce was so vehemently impugned by ignorant philanthropists and wits.

The words Thur, Tur, Toor, Tier, Deer, Stier, Steer in the northern dialects of Europe, in their early and in their latest acceptations, are direct names of well known ruminants ; but in proportion as we pursue the root towards its origin in Central Asia, we find that the parent language of the Gothic and Slavonian, as well as of the Hellenic and others, unite in fixing it upon a large bovine animal, perfectly applicable to that known in *Cæsar's Commentaries* by the name of Urus, implying primæval, ancient, silvan, fierce, mysterious ; still retained in the Teutonic *ur* and its numerous adjuncts. We there find the root of the denomination of several regions in which the parent race of the Tauri, or the Urus, has existed, or still resides. Thus

Turan of Eastern Persia, Turan South of the Caucasus, the cradle of the Turkish nation; the present Turcomania; the Thurgaw; the Canton of Uri; the Thuringian forest; and if we take the root from the Southern and Eastern *Taupos*, *Taurus*, we find the Tauric Cherso-nesus; the Tauri, a Sarmatian tribe; the Taurini inhabiting Italy, near the present Turin, &c. In most of the countries, the gigantic Urus has left his remains, or the more recent Urus has been known to herd. In the same manner, the words *Ox*, *Ochs*, *Opeivos*, derive from the same original language, applied it seems both to the domestic animal, and to rushing waters: thus the river Oxus, or the Gihon or Ghayon, the Cow-river, perhaps figuratively on account of its source rising from an ice-cavern like the Ganges, representing a cow's mouth. The word implied a title of power, and is a proper name: Ochus occurs in Persian history, Okous a bull, is a common name among the Curds (Coords), and other Caucasian (Gaw-cas) tribes * *Bous*, *Bos*, and the Arabic *بق* *Bakr*, Koe, Kuhe, Cow, Gaw and Ghai, are evidently from a common root descriptive of the voice of cattle.

To pursue the thread of this philological inquiry could scarce have deserved attention; but that it indicates the original station whence the languages derived, and the identity of the animal designated in its different states, wherever it was found by the tribes descended from the Caucasian race. In the *Ossements Fossiles*, Baron Cuvier traces, in a luminous manner, the Urus of Cæsar to the large skulls still not unfrequently found both on the continent and in England. Among the most anciently known and celebrated, is that in Warwick Castle; there is another in the British Museum, and there are many in the museums abroad. All are nearly one-third larger than the skulls of

* This list could be greatly extended in names of provinces, tribes, and men, of ancient Central Asia. Both this root and *ur* unite in their primitive meaning of spreading, circumfluent, surrounding.

domestic oxen, square from the orbits to the occipital crest, somewhat hollow at the forehead, and the horns shewing a peculiar rise from their root, at the side of the above crest, upwards, and then bending outwards, then forward and inwards. No domestic race shews this turn, but numerous specimens of inferior size, found fossil in some of the Cornish mines, have this shape, and the Wild Bull of Scotland alone in part retains it*. The rest of the living Taurine group have the square, concave forehead, with the horns rising from the ends of the frontal ridge: they are destitute of a mane, have a deep dewlap, but only thirteen pair of ribs; the tail is rooted in a kind of groove, between the extremities of the coccygian bones, and hangs down to the heels. The original colour appears to have been black. It would be superfluous to enter further into details, which are sufficiently known to every reader.

The *Fossil Urus*. (*B. Urus*.) The characters already noted of this species, are sufficient to give a just idea of a race whose remains lie scattered over the whole of temperate Europe, in the same strata with the lost species of Elephant, and therefore belonging to a zoology of a former period; and again more frequently in later formations, in peat mosses, drained lakes, marshes, and sand beds. From the testimony of Cæsar may be inferred that the colossal species existed in his time, and countenance the conjecture that it was the same which was vanquished by the heroes of antiquity, including that slain by Philip of Macedon, who hung up its spoils in the vestibule of the temple of Hercules. The wild races of inferior size come nearer the present time, and may exist even now in Asia. We have already seen that Herberstein, in his *Moscovite History*,

* This character is strongly marked in the golden bull head ornaments, found in the grave of King Childeric, near Tournay. See *Chifflet* and *Montfaucon*.



WILD OX.

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still acknowledged their existence in certain parks of Masovia, kept no doubt for curiosity, as is done at present with the Bison, and in this country with a variety of Urus; and they can be traced in their more degenerate descendants to a period sufficiently late, not to require the aid of fancy for refuting the remarks made by authors that Herberstein had mistaken the Buffalo for the real Urus*. Seneca and Pliny, as before stated, distinguished the Urus, and the latter complains of the vulgar, among whom Martial must be included, for applying the wrong name of Bubalus to the present species.

Illi cessit atrox Bubalus atque Bison.

We next find the martyr Saturninus attached to the horns of a wild bull, and dragged to death at Toulouse on the spot, where afterwards one of the most ancient churches of Gaul was built, named *du Taur*. Baron Cuvier quotes Gregory of Tours to prove their existence in the Vosges Mountains, under the name of Bubalus, in the reign of Gontram, and also in the Ardennes proved by a passage in the poet Fortunatus, where Gogon the first known *maître* of the palace of Austrasia is represented hunting.

Ardenna, an Vosagus, cervi, capræ, helicis ursi
Cæde sagittifera silva fragore tonat,
Seu validi Bubali ferit inter cornua campum.

The animal is also mentioned in the German verses quoted from the *Niebelungen*—

* The words of Herberstein, are formal. “Uros sola Massovia, Lithuania contermina habet; quos ibi patrio nomine *Thur* vocant; non est magna eorum copia; suntque certi pagi, quibus cura et custodia eorum incumbit nec fere aliter quam in vivariis quibusdam servantur.”—*De rebus Moscovicis Comment.*, p. 33. The plate is not to be mistaken, and with regard to the name of Buffalo, we have seen that in Polish, it is Buwol, and well known in that kingdom. In the earliest map of Poland, both the Urus and Bison are figured.

Dar nach Schluch er Schiere, einen *Wizend* und einen Elch
 Starcher *Ure* viere und einen grimmten schelch *—

where we find one Bison and four Uri slain in the woods near Worms. In the legendary romance of St. Genoveva the Bubalus occurs, but is there expressedly stated to mean the Urus. In England the well-known adventure of Guy Saxon, Earl of Warwick, with the Dun Cow, proves that in the tenth century such actions were still in the memory of the people, if not actually common; and the alleged devastations of the beast are only the same as those which caused the Macedonian Philip to hunt his quarry about mount Orbelat†, and seem to be a trait by which this species was distinguished from the Bison even among the Latin poets: but the adventure of Guy is not singular, for we find Fitz Stephen speaking of the *Uri Silvestres*, which in his time, that is about 1150, infested the great forests round London. The family of Turnbull in Scotland claims the date of its name, from having turned a wild bull from King Robert Bruce, in the act of attacking that hero while engaged in hunting these animals, which must have been early in the fourteenth century; and last Boetius mentions the *Jubati Bisontes*, by which he means the wild race of white-coloured oxen, the breed of which is still extant in a diminutive form, and now preserved in parks.

The ancient German and Polish race is figured only in the works before quoted or their copyists: but we found an old painting on pannel of indifferent merit in the hands of a dealer at Augsburg, which represents the animal, and judging from the style of drawing &c., may date from the first quarter of the sixteenth century. It is a profile repre-

* The reader may refer to the article Elk for the translation of these lines. The bull fights of Spain originated in the chase of the Wild Urus, and a Celtiberian vase with an undeciphered Celtiberian inscription represents the animal and the hunter.

† *Anthol. Græc.* lib. 6.

sensation of a bull without mane, but rather rugged, with a large head, thick neck, small dewlap entirely sooty black, the chin alone white, and the horns turning forward and then upward like the bull of Romania ; pale in colour, with black tips. In the corner were the remains of armorial bearings, and the word *Thur* in golden German characters nearly effaced. We made a sketch of the figure*.

The *White Urus* (*Urus Scoticus*) is a wild breed of the Ox, the probable remains of the genuine Urus. It is of small size, and ranged formerly through the woods of Southern Scotland and the north of England. When this breed was exterminated from the open forests is unknown ; but some time before the reformation, the remnants were already confined in parks belonging to ecclesiastical establishments, from whence they were transferred at the dissolution to that of Drumlarig, and other places. Those in the park of Burton Constable were all destroyed in the middle of the last century by a distemper. The race is entirely of a white colour ; the muzzle invariably black ; the inside of the ear and about one-third part of the outside, from the tip downwards, red ; the horns are white with black tips of a fine texture, and, as in the fossil skull, bent downwards. Bulls weigh from thirty-five to forty-five stone, and cows from twenty-five to thirty-five, fourteen pounds to the stone. Before they were kept in parks, they were probably larger and more rugged ; old bulls still acquire a kind of mane about two inches long, and their throat and breast is covered with coarser hair. Those at Burton Constable differed from the others, they having the ears and tips of the tail black.

Their manners differ from domestic oxen, and may be in part those of the ancient Urus. Upon perceiving a stranger

* This figure agrees with that on the stone of Clunia with a Celtiberian inscription, and representing a hunter facing a wild bull.

they gallop wildly in a circle round him, and stop to gaze, tossing their heads, and shewing signs of defiance: they then set off, and gallop a second time round, but in a contracted circle, repeating this circular mode of approaching till they are so near that it becomes prudent to retire from their intended charge. The cows conceal their young calves for eight or ten days, going to suckle them twice or three times in a day: if a person comes near the calf, it conceals itself by crouching. One not more than two days old, being discovered by Dr. Fuller*, was very lean and weak. On his stroking its head, it got up, pawed the ground, bellowed very loud, went back a few steps, and bolted at his legs: it then began to paw again, and made another bolt, but missing its aim, fell, and was so weak as not to be able to rise; but by this time its bellowing had roused the herd, which came instantly to its relief, and made the doctor retire. When one of this breed happens to be wounded, or is enfeebled by age or sickness, the others set upon it and gore it to death.

These animals were killed, to within a few years, by a grand assemblage of horsemen and country people armed with muskets: the former rode one from the herd, and the latter took their stations on walls or in trees. There was grandeur in the chase, but from the number of accidents which occurred it was laid aside. We believe that at present none remain, excepting at Chillingham Castle, the property of the Earl of Tankerville, near Berwick-upon-Tweed; at Wollaton, in Nottingham; at Gisburne, in Craven; at Limehall, in Cheshire, and at Chartly, in Staffordshire.

The *Domestic Ox*. (*B. Taurus*.) It may be conjectured

* This anecdote is elsewhere ascribed to Mr. Bailey of Chillingham. We understand that there is a large breed, not perfectly white, in the Duke of Hamilton's park in Scotland.

that the original domestication of this species took place in Western Asia, and was performed by the Caucasian nations, who thereby effected a leading cause of that civilization which their descendants carried westward and to the south-east, where the genuine Taurine races, not multiplying or yielding equal returns to human industry and human wants, have caused the veneration in which they are held, and necessitated the prohibition of feeding on their flesh. It is to these circumstances also, that we may refer the domestication of the Buffalo, whose strength and habit was suited to supply the deficiencies of the Ox; and a similar effect has since operated in Egypt, for since the introduction of the Buffalo into that country, domestic cattle are not only fewer, but far from deserving the commendations bestowed upon them by the Ancients.

The character of domestic oxen is absolutely the same as the fossil, and the wild breeds differ only in the flexures of the horns and external appearance, occasioned by the variations of climate, food, and treatment. An opinion has lately been started that the hunched varieties of cattle are derived from a different species, against which no conclusive objection can well be made: when it is considered that the Gobia or Gayal produces a mixed race with the domestic Taurine; that the Yak of Tartary, and even American Bison, are equally reported to copulate with that species, notwithstanding the anatomical differences, and that the times of gestation are not similar. We might be led to look for the parent species of the hunched breeds in the Gayal, because those races seem principally and most anciently established to the eastward of the Burrampootra, and that the purity of these particular distinguishing marks appear less and less evident in proportion as we seek for them to the westward of that river. The hunched races of Africa may be regarded as introduced with the Arabian invasions after the Hegira; for in the numerous representa-

tions of Taurine animals, sacred victims, or in scenes of tillage upon the monuments of ancient Egypt, none occur.

The domestic races with straight backs are, however, beyond a doubt, more pure and nearly allied to *Urus* than the others. We find them inhabiting, or descending more directly from the probable original region of domestication, retaining in their stature and in their colour a closer resemblance with *Urus*, but developing in general a greater extent of horn.

The breeds of the Kisguise and Calmuck Tartars, those of Podolia and Ukraine, of European Turkey, of Hungary, and of the Roman States, are among the largest known. They are nearly all distinguished by ample horns spreading sideways, then forwards and upwards, with dark points: their colour is a bluish-ash passing to black. That in the Papal dominions is not found represented on the ancient bas reliefs of Rome, but was introduced most probably by the Goths, or at the same time with the Buffalo.

Italy possesses another race, presumed to have existed in the Pagan times, valued for its fine form and white colour: it is not so large, but the horns are similarly developed. Tuscany produces this race, and we have seen droves of them transplanted to Cuba and imported into Jamaica.

Ancient Egypt nourished a large white breed, which, however, is not the most common upon the monuments of that country, where the cattle are usually represented with large irregular marks of black or brown upon a white ground. The representations of *Apis* shew the horns to have been turned outwards and upwards (perhaps artificially), so as to figure a crescent, its colours varied: one figure of this sacred ox is black, with a row of singular white streaks descending irregularly down the neck; another is entirely white; a third white with a double oval lengthened ring on the flank; and a fourth, partly covered by

drapery, is rufous*. This breed appears to have spread westward, through Nubia to the shores of the Atlantic, where occasionally fine cattle are seen, and to the south over Abyssinia to Madagascar and Caffraria.

In Abyssinia there is also a large white breed, but the greater number are variously coloured. The Caffres and Hottentots rear a fine race likewise marked with large brown or black clouds: some are of extraordinary size, with the horns directed forward and upwards. It is from these that their Bakeley, or war oxen, are chosen: they ride them on all occasions, being quick, persevering, extremely docile, and governed by the voice or a whistle of the owners with surprising intelligence. They thrive most on the *Zuure Velden* or saline pastures, and that kind of food may cause the peculiarly fetid smell of their breath, noticed by Mr. Barrow. The long horns of some of this breed are often trained by the Namaquas and other tribes, so as to twist in spiral curves or other fanciful forms, said to be managed by means of a warm iron.

Denmark rears a breed of large stature, which most likely produced the tall Dutch race, of which we have seen one weighing two thousand pounds. From this race sprung the Holstein, which was the parent of the old unimproved English breeds; the Vandals or Goths may have conducted it into Spain, and left its traces in the large breeds of Salamanca, and transported from thence to South America, furnished the root of the fine races which cover the Pampas, near Buenos Ayres, and in Cuba; while the large English supplied that of the United States,

Breeds with small and middle-sized horns exist in the Crimea, in a great part of Germany, Sweden, France,

* The figure on the Isiac table, has the head, neck, and croup, black, the rest white. It is possible that these various coloured figures, may represent, not Apis alone, but also Onuphis, Bacis, and Mnevis.

England, Italy, and Spain; and the Polled races, or hornless cattle originally, as it would appear, a German breed, "*ne armentis quidem honor aut gloria frontis*;" according to Tacitus, have spread to Iceland and Norway, where they are often fed on dried fish. They are now abundant in Scotland, exist in France, and about Penaranda, in Spain, from whence they may have been transported to form the Polled breed of Assomption in Paraguay. They are also common in Abyssinia and Madagascar.

Before we enter upon the hunched breeds, it may be proper to give a short account of the principal British breeds, derived from the several above-noticed races.

1. The *Long-horned* or *Lancaster* breed, distinguished by long horns and thick firm hides, long close hair, large hoofs, and depth of the fore-quarter, give in proportion less milk, but more cream. They are of various colours, but in general *finched*, that is, with a white streak along the spine, and a white spot inside of the houghs. The *Improved Leicester* is a slight variety originally bred at Canley, near Coventry.

2. The *Short-horned*, sometimes called the Dutch, includes the varieties, named the *Holderness*, *Teeswater*, *Yorkshire*, *Durham* and *Northumberland*. This has been the most improved, produces milk, usually twenty-four quarts per day, and butter to three firkins per season. Their colours are much varied, but generally red and white mixed, or what the breeders called *flecked*. The Oxen commonly weigh from sixty to one hundred stone (fourteen pound to the stone); they have been fed to one hundred and twenty, one hundred and thirty, and particular ones to one hundred and fifty stone the fore-quarters only.

3. The *Middle-horned*, comprehending the *Devon*, *Hereford* and *Sussex*, most esteemed for draught, active and hardy, do not milk so well as the former, but fatten early. The *Devons* to be pure, must be of a high red co-

lour without white spots, a light dun ring round the eye, and the muzzle of the same colour; fine in bone, and clear neck; thin faced, the tail set on high. The Cows weigh from thirty to forty stone, and the Oxen from forty to sixty. The north Devon is the most esteemed for its flesh. The Sussex and Hereford are larger, of a deep red colour, well made, and bone not larger: an Ox weighs from sixty to one hundred stone.

4. The *Polled* breeds, of which the most esteemed is the Galloway, straight in the back, well moulded, with soft hair, black or dark brindled; not large, weighing generally about forty stone, before they are regularly fattened. They travel well, and reach the London markets, without deterioration. The *Suffolk Duns* are a variety of this race, introduced from Scotland, and crossed.

5. The *Highland* race consists of several varieties, of which the West Highland Argyleshire or Skye form the most valuable: of these the *Kyloe* from the Hebrides, so named, because in their progress to the south, they cross the Kyloes or ferries in the main land and Western Islands. The Bulls are of middle size, of a black, dark brown, or reddish-brown colour without white; head small; muzzle fine; horns rather slender, of a waxy green: they weigh about fifty stone. The other variety is the *Norlands*, their hides are coarse, the make narrow and long legged. The *Orkney* or Zetland are of a diminutive size; an ox weighing about sixty pounds a quarter, and a cow forty. They are of all colours, and their shapes generally bad; but they give a quantity of excellent milk, and fatten rapidly.

6. The Fifehire appears to be an improved breed of the Highland crossed with the Cambridgeshire. They are black, spotted or gray; the horns small, white, very erect: the Aberdeenshire are a variety of them.

7. The *Welsh* have two breeds; one large, dark-brown,

with some white, denoting a cross from the long-horned ; they have long legs, and slender ; the horns white, and turned upwards, and next to the Devon, the best for the yoke. The second is lower, well formed, black, with little white, and good milkers.

8. The Alderney or more properly Guernsey, is small, mostly yellow, or light red, with white about the face and limbs ; they have crumpled horns, and till lately ill-shaped. The true breed is distinguished by a yellow colour within the ears, at the root of the tail, and of the tuft at the end of it : they give excellent milk and fine beef.

The races of France, are principally distinguished into two divisions, among both of which fine breeds are found. The first is commonly designated as *Bœufs de haut crû*, or those who are of middle or small stature ; with a fierce look, thick hide, coarse hair, large dewlap, horns greenish or black ; living in the mountainous departments formed of the ancient provinces of Limousin, Saintonge, Angoumois, Marche, Berri, Gascony, Auvergne, Bourbonnois, Charolois, and Burgundy.

The others styled *Bœufs de Nature*. Their stature is large or middle sized, head and body small, ears and muzzle fine ; horns white, hide thin ; hair soft, and aspect kind : they fatten easily, and belong to low or level lands. Such are the Cholets, Nantz, Anjou, Marçais, Breton, Mans, Dutch, Cotentin and Comtois breeds.

The difference between the straight-backed races, and the hunched, are, beside the hunch on the back, a certain liveliness and activity, also a different voice, for they groan or produce a sound like the shriller and weaker tones of the Gayals ; and in the Chinese, some breeds have the horns placed further back, so that the forehead is actually arched. These races occupy all Southern China, India, and Ceylon. In Persia they appear not to have existed at an early period, if we may judge by the bass reliefs of Chelminar,

where oxen with straight backs and Taurine horns are represented forming part of the tribute of several Satrapies. They now abound in that country, and are spread westward to Morocco and Guinea, and through the Galla States to the Caffres and Madagascar. They have in general small and crumpled horns, and much white in their colouring.

The large species of India, equal to the Bulls of largest stature, have a lump on the back, weighing sometimes fifty pounds; it is usually red or brown: the horns are short and bent backwards.

The middle-sized race, Common Zebu or Deswali of India and Northern Africa, white or blue-gray and white, brown, and even black, breeds commonly with the straight-backed, and loses the hump on the shoulders in the fourth generation. This race has horns mostly bent forward and upwards it is not unfrequent in England.

The Chinese breed, in size equal to the smaller British race; hump not very large; forehead round; very short horns, bent back; dewlap loose; colour often white. It is often figured on china-ware.

The small Zebu race, with small or no horns, commonly whitish-gray: size of a hog.

The Abyssinian breed, white and black in clouds, low on the legs, with the horns hanging loose, forming small horny hooks, nearly of equal thickness to the point; turning freely either way, and hanging against the cheeks. This breed transferred to Caffraria, and mixed with the straight-backed, has lost its hump, retaining the other characters, and is esteemed very valuable.

Beside these varieties, a race remains to be mentioned, reared in Abyssinia, the Galla country, and Northern Central Africa: it is of large size, generally white, and armed with immense horns. Travellers agree that they are hunched; but in some accounts they are considered as

buffaloes, nor does it appear proved, that the hunch is a simple fatty excrescence; there is even some probability, that the ridge of the withers is the principal cause, in which case, the true location of this race would become doubtful. Of this

The *Galla* or *Zanga* race, generally white, with small hunch, black muzzle, small bone, and high legs, is the longest known. The horns turn up vertically, are of a pale horn colour, extremely bulky, and near four feet in length. The next is

The *Bornou* race, likewise white, of a very large size, with hunched back, and very large horns, but not rising vertically; they are couched outwards and downwards, like those of the African Buffalo, with the tip forming a small half spiral revolution. We are indebted to Captain Clapperton for the knowledge of this species. The corneous external coat is very soft, distinctly fibrous, and at the base not much thicker than a human nail; the osseous core full of vascular grooves, and inside very cellular; the pair together, scarcely weighing four pounds. The skin passes insensibly to the horny state, so that there is no exact demarcation where the one commences or the other ends. The dimensions of a horn are, length measured on the curve, three feet seven inches; circumference at base, two feet; circumference midway, one foot six inches; circumference two-thirds up the horn, one foot; length in a straight line, from base to tip, one foot five inches and a half. The species has a small neck, and is the common domestic breed of Bornou where the Buffalo is said to have small horns.

In terminating this review of the Ruminantia, we cannot but express our regret that residing far from the capital, the press could not be superintended with sufficient care, nor the information collected for the purpose, be verified anew, to the extent that it was desired. Others similarly

situated with ourselves, have no doubt felt the difficulties arising from this circumstance. However careful and extensive private notes may be considered when they are first drawn up, they leave a doubt upon the mind, and a wish to re-examine the materials, when they are about to be submitted to the public.

We have entered into a variety of details, some not strictly zoological, but all, we hope, interesting. We endeavoured to fix a number of species, not with the expectation that science will take our opinions for more than their value, but with a wish to state fairly what are our present impressions after a long and attentive study of the order we have investigated. The new subgenera or *Racemi* which are proposed, may partly be converted into genera, if the progress of science should render it preferable; and the specific names are in part the restoration of those by which the ancients designated the species, and in part new. These latter, we leave to the candid judgment of philological naturalists, affixing to our nomenclature, no further importance than that of mere names, many of which date anteriorly to the descriptions that have appeared in print from other Naturalists; feeling more solicitous about the correctness of the statements, than the value of our names: we nevertheless mean not to imply that nomenclature is an unimportant branch of the natural sciences. We regret that this investigation appears with so many questions undetermined, and yet necessary for the precision of classification: some of these, are the result of that haste which always accompanies a traveller, whose principal occupations allow only of certain moments to bestow upon Natural History; and if it had not been for the universally liberal aid and facilities received in the cabinets abroad, facilities which are sometimes denied in this country, these sheets would be still more incomplete than they now are. It is to be hoped, that the truly

philosophic views of the Subscription Museum of Frankfurt, may become universal; for there the enlightened Professor Grätzmer, said "We care not who takes notes, describes or publishes from the materials in our Museum; it is open alike to all Naturalists; we envy not the honour provided science be the gainer."

CHARLES HAMILTON SMITH.

Plymouth, April 1827.

THE
EIGHTH ORDER
OF THE
M A M M A L I A.

THE CETACEA

ARE mammiferous animals without hind feet ; their trunk is continued by a thick tail, which is terminated by an horizontal cartilaginous fin, and their head is united to the trunk by a neck so short and thick, that scarcely any diminution from the width of the body is perceptible. It is composed of cervical vertebræ extremely slender, and partly united, and, as it were, glued together. The bones of the anterior extremities are so shortened, flattened, and enveloped in a tendinous membrane, that they are reduced to positive fins. In fact the Cetacea have altogether the external form of fishes, with the exception that in the latter the fin of the tail is vertical. Accordingly they remain continually in the water ; but as they respire by lungs, they are obliged to rise frequently to the surface to take in fresh supplies of air. However, the characters of warm blood, ears with external though small openings, viviparous generation, mammæ for the purpose of suckling

their offspring, and all the details of their anatomy, sufficiently distinguish them from the class of fishes.

The brain is ample, and its hemispheres well developed. That part of the cranium which contains the external ear is separated from the rest of the head, and only adheres to it by means of ligaments. The ears are not externally protuberant, nor are there hairs upon the body.

The form of their tail obliges them to wave it up and down in swimming, and is of great assistance in enabling them to elevate themselves in the water.

We shall add to the genera hitherto reckoned among the Cetacea, those which were formerly confounded with *Trichecus*: they form our first family, or

THE HERBIVOROUS CETACEA.

Their teeth have flat coronals, a character which determines their mode of existence. Accordingly they frequently emerge from the water to seek for pasture on the shore. They have two mammæ on the breast, and hairs like mustachios, two circumstances which, when they raise the anterior part of the body above water, give them some resemblance to men and women, and have probably occasioned those fables of the ancients concerning tritons and sirens. Though in the cranium the osseous part of the nostrils opens towards the top, yet the opening in the skin is at the termination of the muzzle.

THE LAMANTINS, OR MANATIS,

(MANATUS, Cuv.)

Have an oblong body, terminated by an oval elongated fin: the cheek-teeth, eight in number altogether, have square coronals, marked with transverse hillocks. There are no incisors nor canines in the adult subject; but in the very young ones we find two very small sharp-pointed teeth in the intermaxillary bones, which speedily disappear. Vestiges of claws may be discovered on the edges of their fins, which they use with tolerable dexterity in creeping and carrying their little ones. This has given rise to a comparison of these organs with hands, and hence these animals have been called *Manatis*, which word, by corruption, became *Lamantin*. The stomach is divided into several sacs or receptacles: the cæcum is separated into two branches, and they have an inflated colon. All herbivorous characters.

In consequence of their mode of living, they have also been called *sea-cow*, *sea-horse*, &c., and by reason of the mammæ, *mermaids*, &c. (*Trichecus Manatus*, Linn.) Buff. XII., LVII.

They are found towards the mouth of rivers, in the hottest parts of the Atlantic Ocean, and it would appear that those of the American rivers differ specifically from those of Africa. They grow to fifteen feet and upwards in length. Their flesh is used as food.

The DUGONGS, Lacep. (HALICORE, Illig.)

The cheek-teeth are composed each of two cones united at the side. The teeth implanted in the incisive bone are preserved, and grow to such an extent as to become genuine pointed tusks; but they remain in a great measure covered by fleshy lips which bristle with mustachios. The body is elongated, and the tail terminated by a fin in the form of a crescent.

But one species is known, which inhabits the Indian Sea, and which many travellers have confounded with the Lamantin.

This has also been called the *Siren*, *Seacow*, (*Renard, poiss des Indes, pl. xxxiv., f. 180.*)

The STELLERES, Cuv. (RYTINA, Illig.)

Appear to have on each side only a single cheek tooth with flat coronal, and bristling with plates of enamel. Their fins have not those little claws observable on the Manatis; and according to Steller, who first described them, their stomach is also much more simple.

One species only is known, which is found in the north part of the Pacific Ocean.

The second family, or

THE COMMON CETACEA,

Are distinguished from the preceding by that singular apparatus called *spiracles*. As they swallow with their prey an immense quantity of water, some

mode was necessary to enable them to get rid of it. The water passes into the nostrils by means of a peculiar disposition of the palate, and is accumulated in a sac placed at the external orifice of the cavity of the nose, from which it is expelled with violence, by the compression of powerful muscles, through a very narrow aperture situated at the top of the head. Thus it is that the whales produce those water-spouts observed by navigators at such a considerable distance. Their nostrils, thus continually exposed to the influx of salt water, cannot be lined with a membrane of sufficient delicacy to enable them to detect odours with any acuteness. The olfactory nerve is excessively small, and if they do enjoy the sense of smelling it must be in a very faint degree. The larynx, of a pyramidal form, penetrates to the back part of the nostrils, to receive the air and conduct it to the lungs, without the animal being necessitated to put its head and throat out of the water. There are no projecting laminae in the glottis, and the voice is reduced to simple lowing. They have no vestige of hairs, but the whole body is covered with a glossy skin, under which is a coat of thick fat, from which the oil is produced that renders these animals an object of such attention.

The mammae are situated near the anus, and the fins are incapable of grasping anything.

The stomach has five and sometimes even as many as seven distinct pouches. Instead of a single spleen, they have many small and globulous.

The species which have teeth, have them all of a conical form exactly resembling. They do not chew their food, but swallow rapidly.

Two small bones, suspended in the flesh near the anus, form the only vestige of posterior extremities which remain.

Many have on the back a vertical fin of tendinous substance, but not supported by bones. Their eyes, flattened in front, have a thick and solid sclerotic. The tongue has only smooth and soft teguments.

They may be again subdivided into two small tribes. Those whose head is in the ordinary proportion with the body, and those which have it immeasurably large.

The first comprehends the Dolphins and Narwhals.

The DOLPHINS (DELPHINUS, L.)

Have teeth in both jaws, all simple, and almost always conical. They are the most carnassial, and, in proportion, the most cruel of the order. They have no cæcum.

The DOLPHINS, properly so called, (DELPHINUS, Cuv.)

Have the throat forming in front of the head, a beak more slender than the rest.

*The Common Dolphin (Delphinus Delphis. L.) Lacep.,
Cet. pl. XIII., f. 1.*

With depressed beak, and armed on each side

of the jaw with from forty-two to forty-seven slender teeth, arched and pointed; black above, white underneath; in length from eight to ten feet. This animal, found in numerous troops in every sea, and celebrated by the velocity of its movements, which sometimes cause it to precipitate itself on the helms of vessels, appears to have really been the Dolphin of the ancients. The entire organization of the brain, indicates that degree of docility which they universally attributed to this animal.

The Dolphin with slender beak (Delph. Rostratus, Shaw.)

Head more convex, and beak more compressed and slender. Twenty-one, twenty-two, or twenty-three conical teeth at most on each side, and in each jaw. Its tints are paler, which has gained it the appellation of the White Dolphin. It is said to inhabit the American Seas.

The Great Dolphin (Delphinus Tursio.) Vulg. the *Whistler*.
Lacep. XV. f. 11. (Bonnaterre.)

Beak short, wide, and depressed. Twenty-one to twenty-three teeth, altogether conical, and often blunted. Some individuals arrive to more than fifteen feet in length. It would appear that they are to be found in the Mediterranean as well as in the ocean.

The PORPUSES (PHOCÆNA, Cuv.)

Have no beak, but a muzzle short and uniformly convex.

The Common Porpus, (Delph Phocæna, L.) Lacep.

XIII. f. II.

Compressed trenchant teeth, of a rounded figure, from two to five-and-twenty in each jaw, on each side. Blackish above, white underneath. It is the smallest of the Cetacea, seldom passing four or five feet in length: very common in all our seas, where it is found in large troops.

The Grampus (Delph. Orca et Delph Gladiator.) Lacep. XV.

I., and not so good, v. III.

Thick conical teeth, a little crooked, eleven in all, the posterior ones flattened transversely. The body black above, white below; a white spot on the eye in the form of a crescent; the dorsal fin elevated and pointed.

This is the largest of the Dolphins, being frequently from twenty to twenty-five feet in length, and a most cruel enemy to the Whale. The Grampusses attack the latter in troops, harass it until it opens its mouth, and then they devour the tongue.

The DELPHINAPTERA (Lacep.)

Differ only from the Porpusses in having no dorsal fin.

The Beluga. (Delph. Leucas, Gm.)

Nine teeth throughout, thick and blunt at the end; spine of a yellowish white; as large as the Grampus. Found in all the Icy Sea, whence it often ascends pretty high into the rivers.

The HYPEROODONTES, (Lacep.)

The body and muzzle are conformed like those of the Dolphins proper; but there are only two small teeth in front of the lower jaw, which do not always appear externally. In the palate are many small tubercles.

Only one species is known from twenty to five-and-twenty feet in length, and perhaps more. It is taken in the North Seas, and is often named the Beaked Whale.

The NARWHALS (MONODON, L.)

Have no teeth, properly speaking, but only long, straight, and pointed tusks, implanted in the intermaxillary bone, and directed in the line of the axis of the body. The form of the head and body much resemble that of the Porpusses.

Only one species is well known.

Monodon Monoceros, Lin. (Lacep. IV. VIII.)

The tusk of this animal, furrowed into a spiral form, is sometimes ten feet long, and for a

long time was called the horn of the unicorn. It has the germs of two tusks, but it rarely happens that both grow equally. In general that on the left side alone is developed, and the other remains concealed, during the existence of the animal, in the right alveolus. This small tusk we have ourselves found in many crania. It is not developed, in consequence of its interior cavity being too speedily filled by the ivory matter, and the gelatinous kernel thus becoming obliterated. The Narwhal may be almost double the length of its tusk. The skin is marbled, as it were, with brown and whitish; the mouth small; the spiracle on the top of the head; no dorsal fin, but merely a projecting crest all along the spine. Some tusks of the Narwhal are found perfectly smooth.

The other Cetacea have the head so large, that it makes one third, or one half the length of the body; but the cranium or brain, does not partake in this disproportion, which is altogether owing to the enormous developement of the facial bones.

The CACHALOTS (PHYSETER, L.)

Are Cetacea with a very voluminous head, excessively inflated, especially in front. No whalebone in the upper jaw, nor teeth, except sometimes very small ones not projecting. The lower jaw narrow, elongated, and, corresponding to a furrow in the

upper, is armed on each side with a range of conical or cylindrical teeth, which enter into the corresponding cavities of the upper jaw when the mouth is closed. The upper part of the enormous head consists only in large cavities, covered and separated by cartilages, and filled with an oil which fixes when it cools, and is well known in commerce under the absurd name of *spermaceti*. It is this which renders the Cachalots an object of research, for their body is not supplied with much fat. These cavities are very different from the true cranium, which is rather small, placed under them, and contains the brain as usual. It appears that canals filled with this *spermaceti* are distributed in many parts of the body, and communicate with the cavities which fill the mass of the head. They are even interlaced in the usual fat found throughout the skin.

The odorous substance so well known by the name of ambergris, appears to be a concretion formed in the intestines of the Cachalots, and principally in the cæcum. It more especially takes place in certain morbid states of the system.

The species of Cachalots are any thing but well determined. The *Macrocephalus* of Shaw and Bonnaterre, which seems to be the most common, has only a callous eminence instead of a dorsal fin. In the lower jaw, on each side, are from twenty to three-and-twenty teeth, and there are some small conical ones hid in the gums of the upper. The spiracle is single, and not double as is usual with most part of the

other Cetacea; nor is it symmetrical, but directed towards the left side, and terminated on this side on the front of the muzzle. The left eye is said to be much smaller than the other, and fishermen consequently attack the animal on this side. This species abounds in many seas, if it be true that it furnishes all the spermaceti and ambergris of commerce, for these substances are derived both from north and south. The Cachalots without fins are taken as far as the Adriatic.

The PHYSETERS (Lacep.)

Are only Cachalots with a dorsal fin. Two species are only distinguished among them, *Microps* and *Tursio*, or *Mular*, and that only by the equivocal character of arched or straight teeth, sharp or obtuse.

They are found in the Mediterranean as well as in the Icy Sea. Those of the last are said to be cruel enemies to the Seals.

The WHALES (BALÆNA, L.)

Are equal in size to the Cachalots, and also in the proportional magnitude of the head, though this is not so much inflated in front; but they have no teeth. Their upper jaw is much after the form of a keel, has both its sides furnished with thin transverse laminæ called whalebones, formed of a sort of fibrous horn, slender at their edges, and which serve to retain the little animals, on which these enormous

Cetacea live. The lower jaw sustained by two osseous branches arched externally and towards the summit and totally unarmed, lodges a fleshy tongue, very thick, and envelops, when the mouth is closed, all the internal part of the upper jaw, and the corneous laminæ with which it is invested.

These organs do not permit the Whales to live on animals so large as their enormous size would lead us to believe. They live on small fish, but still more on worms, mollusca, and zoophytes, and it is said that they principally take those very small ones, which become entangled in the filaments of the whalebone: they have a short cæcum.

*The Common Whale, (Bal. Mysticetus) * Lacep. Cet. I. f. 1.*

The largest of known animals; enormous head, obtuse in front; almost as high as long; no fin on the back. Its fat yielding an immense quantity of oil is such a desideratum in commerce, that it is pursued annually by entire fleets. Formerly it used to venture into our

* The *φάλαινα* of Aristotle and Ælian, which was an enemy of the Dolphins, appears to have been a large cetaceous animal armed with teeth. Aristotle was acquainted with no true balæna but his *mysticetus*, which was probably the Whale with wrinkled throat in the Mediterranean. It is probable, however, that Juvenal means the Common Whale in this verse:

Quanto Delphinis balæna Britannica major;

but the Latins applied the term *balæna* very vaguely to all the large Cetacea, as the people of the North do still the name of *Whale* or *Wall*.

seas, but it has gradually retired into the depths of the North, where its numbers diminish daily. Beside the oil, it also furnishes the black and flexible whalebone eight or ten feet long. Each individual has eight or nine hundred of these strips on each side of the palate. It is said that this monstrous animal feeds only on the small mollusca which swim in the seas it inhabits. The Whale arrives to eighty or one hundred feet in length, and as many in circumference. Its throat is twenty feet wide in the aperture ; the young one is twenty feet long at the moment of its birth. A single individual yields a hundred and twenty tons of oil. Shell animals attach themselves to its skin and multiply there as on a rock. Some even of the family of the *balanus* penetrate into the skin. Its excrements are of a beautiful red which tinges cloth pretty well.

The Nord-caper, (Bal. Glacialis, Klein) Lacep. pl. II. and III.

As long but more slender, and with a more pointed muzzle than the Whale. It has much less fat and is more agile and difficult to catch. Accordingly, it is seldom sought after except in the failure of the whale fishery. It is common on the coasts of Norway and near the North Cape whence it derives its name. It devours much fish,

The other species (THE BALENOPTERA Lacep.) have a fin on the back. They are again subdivided according to whether the gills be smooth or wrinkled.

The BALENOPTERA with smooth belly,

Approach very nearly to the proper whales: only one species is well known, named

Gibbar, by the Basques (*Balæna Physalus*, L.) *Finn-Fisch* of the Dutch, &c., (Lacep. I. f. 11.)

As long, but much more slender than the Common Whale: very common in the same haunts, but avoided by fishers, as it yields but little oil, and is extremely ferocious. It is difficult to catch, and even dangerous for small vessels, by the violence of its movements.

The BALENOPTERA with wrinkled belly,

Have the skin of the under part of the throat and chest folded longitudinally in very deep wrinkles, and susceptible of great dilatation. Their use in the economy of the animal is not known.

One species only is well determined.

The Jubarta of the Basques, (*Bal. Boops*., L.) *Lacep. I. f. III., IV. f. I & II., V. f. I., et VIII. I & II.*

Is said to approach to the length of the Common Whale, but has all the dangerous qualities, &c., of the *Gibbar*.

These Whales have been taken in the Mediterranean as well as in the Ocean.

SUPPLEMENT TO THE ORDER

CETACEA.

THE name of this order is derived from the Greek Κῆτος, a name employed originally by Aristotle, to designate those marine animals in which he recognised characters essentially different from those of the class of fishes, and which, though so little like in external form, do yet appertain to the class Mammalia.

The first among the Herbivorous Cetacea, according to the Baron's arrangement, are the LAMANTINS, or MANATIS. To the zoological description of this genus we have nothing to add.

The Lamantins live on the shores of the Atlantic, and frequent the mouths of rivers. Sometimes they ascend those rivers to a considerable distance, advancing occasionally, according to the account of La Condamine, more than a thousand leagues into the inland. They are essentially herbivorous, assemble in very numerous troops, and appear to possess a mild and sociable character. The females have generally one or two little ones at a birth, and the period of gestation is reported to be one year.

There are two species well characterized, the *Lamantin of America*, (*Manatus Americanus*, Buff.) and the *Lamantin of Senegal* (*Manatus Senegalensis*.) The first, when adult, is sometimes more than twenty feet in length. A foetus of this species, observed by M. F. Cuvier, was fourteen inches altogether in length; the head four inches nine lines, from muzzle to occiput; the tail was about three inches long and two wide; the eyes were remarkably small, and the aperture of the ear excessively so. It was moreover concealed by the epidermis, and could not be observed until

that was removed. The nostrils were middle sized, approaching each other, and placed on the upper part of the muzzle; the head was thick and clumsy, swelling in the upper part and rather flatted above the eyes; it terminated in a gross projecting muzzle; the upper lip was entirely divided into two distinct portions, furnished at their external edge with thick short and bristling hairs; the under lip was furnished in the same way; the neck was extremely short, but yet distinct. The anterior members are placed almost under the head, and nothing is seen externally but a short compressed fore-arm, terminated by a fin-shaped hand, having four fingers enveloped in the skin, of which the middle and the two lateral alone are terminated by a short nail; the body was thick and short; the tail thick at the origin, and flat and broad towards the end; the skin was brown, thick, much wrinkled, and furnished with a few hairs of a gray colour.

The *Lamantin of Senegal* appears to be a distinct species, observed only in that quarter of the world. Adanson describes it as eight feet long, having a conic head, round and very small eyes, with the iris of a deep blue; a cylindrical muzzle; fleshy and thick lips; no visible aperture of the ears; four nails on the edge of the fins; horizontal tail, and thick skin of an ashy lilac. The Negroes call it *Cercon*.

This *Lamantin* has the osseous head shorter and wider altogether than the American species. The lower jaw is also much less rounded, and the upper as well as the rest of the head much less narrowed and long.

To the *Dugong*, Illiger has given the name of *Halicore*, derived from the Greek and signifying daughter of the sea.

But one species as Cuvier observes is known. It inhabits the Indian seas. Its head is rounded towards the top, oblique from the forehead to the muzzle, which last is vertical and terminates abruptly. This part of the face is formed by the upper lip which hangs from each side of

the mouth, forming those two mobile and fleshy pendants which cover a part of the lower jaw laterally. These are set with small corneous spines, about an inch long, which are doubtless organs of touch ; between these is a slope in front of the upper jaw, which receives the extremity of the lower, above which the point of the tusks is perceptible on each side. The interior of these lips is furnished with corneous warts, which it is supposed the animal employs to tear away the alga on which it feeds. The nostrils form two parabolic clefts, approximating at the upper extremity of the muzzle ; the opening of the ear is very small, and there is no external conch ; the eyes are simple and small ; the fins shew no vestige of nails, but have warty callosities underneath at their external edge ; the tail is horizontally sloped or cut like the arch of a circle ; the body is wider at the middle than the extremities, and the side of the tail is more slender than the opposite side ; the skin is smooth, and has some scattered hairs. An individual taken near Singapoer, and described by M.M. Diard and Duvaucel, was seven feet long. These gentlemen found suspended in the flesh, on each side in front of the eighth lumbar vertebra, two narrow and flat bones evidently forming the rudiments of a pelvis ; the vertebræ were fifty-two in number, and the ribs thirty-six ; the ventricles of the heart were separated at their origin ; the lungs were not lobulated ; the tracheal artery was bifurcated immediately below the larynx ; the liver was divided into two large lobes, and the gall-bladder covered by a smaller lobe in the shape of a tongue. The kidneys are large, and the bladder susceptible of great extension.

The animal had two stomachs : the second smaller than the first, and near its orifice two conical cæcums.

The Malays call this animal *Douyong*, and hold its flesh in such estimation, that it is reserved for the tables of the Sultan and the Rajahs.

The extraordinary animal described by Steller, and which he termed the *Lamantin of the North*, evidently appears, even on the most superficial inspection, to be of a different genus from the *Manatus Americanus*. The Baron has accordingly separated these animals under the name of *STELLERES*, derived from their first describer.

Instead of the usual epidermis, this animal has a kind of bark or crest an inch thick, composed of fibres or tubes, perpendicular on the skin. This singular bark is so hard that steel can penetrate it with great difficulty, and even when it is cut it resembles ebony, as much in its compact texture, as in its colour. These fibres are implanted in the true skin by as many small tubes, so that when the bark is torn away, the surface which attaches to the skin is rough like shagreen, and the skin itself is reticulated by as many little holes as there are tubercles in the bark. The external surface of the bark, as might be expected, is unequal, rugged, fissured longitudinally, and without hairs, for the fibres, in fact, which compose it, are properly nothing but hairs glued together, and furnishing a coat of mail. In a word, this animal is completely armed with a substance similar to that of the hoofs of the Horse or the Ox, or the sole of the Elephant or Camel. This kind of armour is observable in the Great Whale, but has never existed in the genuine Lamantin. The upper lip is double, and so is the lower, both divided into internal and external.

The teeth are singular; they are not simple, numerous, and provided with roots as in the Lamantin. In each jaw, on each side, is a composition-tooth, or rather plate, comparable to the palate of the Striped-Eagle, and which is not fixed by roots, but is applied and united by an infinity of vessels and nerves, which penetrate from the jaw into this dentary palate by a quantity of little holes which make its surface contiguous to the maxillary bone, altogether porous or spungy. The same has been observed in the

teeth of the *Ornithorhyncus* and *Orycteropus*—the triturating surface is unequal, and hollowed with tortuous furrows, intended to facilitate mastication.

The tail diminishes from the anus to the fin which terminates it, and the apophyses of its vertebræ render it almost quadrangular.

The fin is about seventy-eight inches broad, and only seven long, which is quite the reverse of that of the true *Lamantin*. In *Steller's* animal too, it has the figure of a crescent, and is terminated on each side by a long horn.

The fins have their shoulder-blade, humerus, bones of the fore-arm, carpus and metacarpus, but there are no vestiges of nails, or phalanges; the stomach is simple; the œsophagus inverted in the middle, and a thick gland placed near this inversion pours juices into it through numerous and wide pores.

The intestines very much resemble those of a horse; the cæcum is enormous, and as well as the colon is divided into large inflated portions by its ligaments; the bones of the nose articulate one with the other, as in animals in general.

The pelvis is composed of two ossa innominata similar in some respects to the cubitus of man, attached on one by means of strong ligaments, to the twenty-fifth vertebra, on the other, to the os pubis.

There are six vertebræ in the neck, nineteen in the back, and five and thirty in the tail. *

This animal does not eat terrestrial herbs like the *Lamantin*, but only *fucus*.

Steller observed this animal in the North Pacific.

The *Lamantins* seen by *Dampier* at New Holland and Mindanao, are referred by *Pennant* and *Shaw* to this genus. But it is more than probable, that they belong to the *Dugong*.

Fabricius assures us, that he found in *Groënland* a cranium with dentary bones like those described by *Steller*.

A good figure and complete description of this animal, is yet a desideratum in Natural History, which we hope to see supplied by some of our own countrymen.

Pursuing the arrangement of our author, we commence the Common Cetacea with the DOLPHINS, although other writers class them under the division Cachalot, making that and Balæna include all the Cetacea, herbivorous excepted.

The form of the *Common Dolphin*, (*Delphinus Delphis*) very exactly resembles the figure that two cones would make with the bases joined together. The head is terminated by a very protruded muzzle, considerably flattened from the upper to the under part; many writers have compared it to an enormous beak, shaped like that of a goose or swan.

The aperture of the mouth of this animal, equals in length the rest of the body. It exhibits two jaws, each equally advanced, and each provided with forty-seven conical and pointed teeth, so arranged, that when the mouth is closed, they enter each into the interstices between the opposite ones: the number, however, varies according to age and sex.

The tongue has several small perforated eminences, principally towards its root, and is terminated in a point, cut out into narrow, short, and obtuse strips. Though this organ is very fleshy, it is more mobile than in the other Cetacea. It is said to be very agreeable eating.

The two spiracles unite in one and the same aperture, situated a little above the eye; the organ of vision is almost in the direction of the extreme point where the two lips unite. The meatus auditorius appears externally only by a narrow orifice, so small as to be with difficulty perceptible. Nevertheless, the internal organization of the ear, renders this animal susceptible of great attention; it produces a sensibility to musical sounds, and enables the Dolphin to distinguish at a considerable distance, the cries of joy or alarm of its congeners.

The cranium of the Common Dolphin is externally very convex; its neck is very short, and it results from this conformation, united to the close adherence of the atlas which is the first of the cervical vertebræ, to the second, that no motion of the head can be independent of the body. Like the majority of other Mammalia, it has thirteen dorsal vertebræ, and fifty-three lumbar, sacral, and coccygian. All are surmounted by apophyses less elevated in proportion as they approach the vertebræ of the tail. These last are furnished with apophyses, which also diminish gradually as far as the three last caudal vertebræ, which are destitute of these processes; the ribs adhere intimately to the dorsal vertebræ.

The diameter of the body does not exceed one-fifth of its total length, which is almost nine feet. The animal is consequently less embarrassed in its abrupt and rapid movements, to which the force of the muscles of the tail and of that of the fin which terminates it, contributes most materially. This fin is divided into two large lobes a little sloped, the width of which is nearly equal to two-ninths of the total length of the animal.

The skin of this dolphin is smooth, soft, and shining. These qualities are derived from the coat of fat immediately under it. The colour of the epidermis is sometimes of a livid brown, sometimes blackish on the back, and pearly gray on the sides and belly, patched with black. Sometimes it is of a gray more or less deep, and sometimes of a lustrous snow-white. The flesh below the fat is hard, and often exhales a fetid and most unpleasant odour. Gestation continues for ten months, and the female rarely brings forth more than one at a birth. She suckles the young with the utmost care, carrying it under the pectoral fins which answer the purpose of arms: while the little one is yet feeble, she exercises it in swimming, sports with it, defends it with the utmost intrepidity, and never quits it

until it can do without her cares. Their young grow rapidly ; in ten years they attain their utmost length.

Not only are the female dolphins united by the bonds of a tender and durable affection to their young, but the male also attaches himself for life to his female companion, and becomes her most zealous guardian and protector. It is even said, that the sentiments of mutual affection in these animals for each other, extend to all the individuals of the species. Accordingly they are frequently seen assembled in numerous troops, in regular phalanx, formed, as it were, into order of battle. They are commanded and directed by a chief, chosen from among those who have displayed the greatest vigour and intrepidity in the combat.

Some authors, more especially the ancients, have not only celebrated the mutual friendship subsisting among the Dolphins themselves, but have also asserted that they have a lively and natural affection towards the human species, with which they are easily led to familiarize. They have recounted many marvellous stories on this subject, which would be rather out of place in a sober treatise on Zoology. All that is known on this point for certainty is, that when these animals perceive a ship at sea, they rush in a crowd before it, surround it, and express their confidence by rapid, varied, and repeated evolutions, sometimes bounding, leaping, and manœuvring in all manner of ways, sometimes performing complicated circumvolutions, and exhibiting a degree of grace, agility, dexterity, and strength, which is perfectly astonishing.

We must not, however, be deceived by such external show of affection. These animals represented as susceptible of so much attachment to man, are thoroughly carnivorous, and if they follow the track of vessels, it is perhaps with no other view than the hopes of preying on something that may fall from them.

The Dolphins subsist indiscriminately on all sorts of

animal and vegetable substances. They exhibit, however, a peculiar avidity for certain fishes, such as cod, &c.; they pursue their victims with the utmost pertinacity into every sea, for all climates are alike to them. They are equally to be found in the Northern Atlantic, and under the Equinoctial, near the shores of Western America, along the coasts of China, and in all the African and European seas.

The *Marsouin*, *Porpoise*, or *Delphinus Phocaena*, is a striking example of the partiality of fortune in the distribution of her favours. While the Dolphin has been the theme of poets and historians, and has been almost exalted to the rank of divinity, this animal possessing the same attributes, the same habits, the same affections, and the same qualities, has received from mariners and fishermen the degrading appellation of *Marsouin* or Sea-hog. The word porpoise or porpus, has a similar meaning, being a corruption of the Latin *porcus piscis*.

This animal is found in the Baltic, near the coasts of Groënland and Labrador, in the Gulf of St. Lawrence, throughout the whole of the Atlantic, and in the great Pacific Ocean; in the Gulfs of Panama, Mexico, and California, near the Gallapagos Isles, and in short, in almost every sea.

The Porpoises are constantly to be found sporting in the stormy ocean, and traversing its agitated surface with the most complete tranquillity. They cut without difficulty the foaming wave, and when the black tempest appears to convulse the sea even to its profoundest abysses, they float upon its bosom with the same security as in the sunny hour of perfect calm. It is to its muscular force and the powerful instruments of natation with which nature has provided it, that the Porpus owes the astonishing rapidity of its motion, and those wonderful springs and evolutions which the eye can scarcely follow.

This animal exhibits the figure of a very elongated cone

in its body and tail. The head may be considered as another very short cone, the base of which is closely united to that of the former ; it is slightly inflated above the eyes which are small, and situated at the same elevation as the division of the lips ; the iris is yellow and the pupil triangular. Beyond the organ of vision and at a small distance, is that of hearing, which from its diminutiveness is difficult to distinguish.

The tongue is broad, soft, and flat, and apparently indented at the edges.

The orifice of the two spiracles, is in the form of a crescent, whose convexity faces the tail. This respiratory organ, is placed above the space comprised between the eye and the aperture of the mouth.

The pectoral fin, situated very low, is almost three twentieths of the entire length of the animal ; the caudal, about one-fourth of the same, has two large sloping lobes, from the middle of the division of which, proceeds a longitudinal projection extending over the back as far as the dorsal fin. This tail, with the assistance of these vast lobes, forms a powerful lever, and contributes mainly to the various evolutions of the animal.

The epidermis is very soft to the touch, and of a deep blue or brilliant black above, whitish underneath ; under the true skin is a thick bed of very white fat convertible into oil.

The Dutch, Danes, and most of the marine people of Europe, pursue this animal into remote and inhospitable regions, to obtain this fat. The Laplanders and people of Groënland, whose taste is not remarkably delicate, feed on all the parts of it, the flesh of which they boil or roast, having left it first to putrify that it may become more tender.

In the time of gestation, care of the young, &c., the *Phocænæ* precisely resemble the Dolphins. They prey on a

great number of different species of fish, which they seize with astonishing promptitude and address.

Notwithstanding the quickness with which they disappear under the water, numbers of them fall victims to the murderous skill of fishermen. They have another enemy to fear not less redoubtable, one of their own order, *Physeter Mycrops*, which pursues them with indefatigable perseverance, and devours them with amazing rapacity.

There are two varieties of the *Delphinus Orca*, the *Orc* and the *Grampus* (*Delphinus Gladiator*). The first is an animal of considerable power, though the tyranny which it exercises in the empire of the waters, has been much exaggerated by the genius of fiction.

The audacity of these animals is excessive when assembled in troops. These bands are so bold and ferocious, that though the isolated individuals never prey except on such fishes as the pleuronectes, &c., thus mustered they will venture to attack the largest Cetacea. They fall upon the Great Whale with such fury, and reiterate their attacks with such agility and address, that the surface of the sea is quickly covered with blood, flowing in torrents from the wounds they have inflicted on their gigantic enemy. He vexed, tormented, and assailed on all sides by such numbers, has no chance of escaping death, but by a flight so precipitate, that he is generally driven on the shore, where he is likely to encounter inevitable death from the harpoon of the fisherman.

The *Orc* is about eighteen or twenty feet long, and fifteen in circumference in the widest part of the body: the tail is elongated, the cranium not very convex, and the muzzle short and rounded; the pectoral fins which are formidable weapons, are broad and oval, and the general colour is black, brown, and white, in the under parts.

There is much affinity between the *Delphinus Gladiator* and the last. The colours are similar, and the head is very

convex: but the most characteristic trait, is a sort of white crescent on the upper part, which contrasts strongly with the deep tint of the rest of the body in this part. The shortness of the muzzle gives it an appearance of being truncated; the jaws of equal length, are armed with very sharp teeth, and the eye much more elevated than the commissure of the lips, is yet as near as they are to the termination of the muzzle; the pectoral fins near six feet long and three broad, are flat and widened in the shape of a spatula; the dorsal which has been compared to an immense sabre, is much longer than that of the Orc: it is almost on the nape of the neck; its elevation is sometimes six feet. The caudal fin is divided into two lobes which leave between their reciprocal extremities almost a space of about nine feet: they form a crescent, the concavity of which looks to the muzzle.

They are found in Davis's Straits, on the coasts of America and Spitzbergen, in troops of from six to eight. They live usually on fish, but will attack the Common Whale, especially when young: they assail him on all sides. This peaceable animal, tormented, harassed, and even forced to succumb under the attacks of these audacious adversaries, opens his mouth to respire a little; in an instant these ferocious assassins seize with fury upon his tongue and tear it to atoms.

The *Nesarnack* (*Delph. Nesarnack*, Lacep.) is found in the Northern Atlantic; the natives of those coasts feed upon its flesh, fat, and entrails. It is more than nine feet long, and its greatest thickness is between the pectoral and dorsal fin; the skin is blackish above and white underneath.

The head is rounded; the muzzle flattened, and bears some resemblance to the beak of a duck; the two jaws, of which the lower is the longest, are furnished with forty-two cylindrical teeth, straight, and very much blunted at the summits.



THE FRONT DOOR

TO THE FRONT DOOR

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The common orifice of the two spiracles is above the eye, nearer however to the muzzle than this organ.

The pectoral fins small and sloped, are situated very low; the dorsal which bears a certain extent is also sloped. The winter is said to be the period of parturition.

The *Delphinus Feres*, Lacep., is about fifteen feet long, the skin which is blackish is very fine; the upper part of the head is elevated and convex.

In each jaw, and both are of equal length, are twenty unequal teeth, ten of which are thicker and larger than the rest; one half of the tooth is enclosed in the gum, and the other half, is of a rounded form at the top, ovoid and divided into two holes by a longitudinal curve.

When this animal has received a few deep wounds, it sends forth the most piercing cries, which, when simultaneously repeated by a number of individuals of the same species, produces a bellowing excessively deep and terrific.

The *Dolphin of Peron* is blackish-blue on the back; end of the muzzle and extremity of the fins and tail of a brilliant white.

We have inserted a figure of a new species of Dolphin in the museum at Paris, named by the Baron in the "Ossemens Fossiles" *Delphinus Frontatus*, of which nothing is known beyond its specific characters mentioned in the Table.

The *Dolphin of Commerson* was discovered in the neighbourhood of Terra del Fuego, and in the Straits of Magellan. The extremities are black, and all the other parts of a polished and silvery white. Commerson has seen them in numerous bands in the rivers of Cape Horn, swimming round his vessel, and remarkable for the facility with which they outswam it. This Dolphin is less than the Porpoise.

The family of the DELPHINATERI contains two species.

The *Beluga* (*Delphinus Leucus*) is found in the Arctic Icy Sea, in the Northern Atlantic, and especially in Davis's

Straits. When the winters are excessively rigorous, it is reported that it quits these icy climates in search of more temperate regions, and sometimes ascends rivers.

These animals are very gentle, and so familiar, that when they discover a vessel they swim away in a crowd to meet it, forming a kind of suite, and playing all manner of gambols. The Beluga however, is no object of research to fishermen, who set little store by it. Mariners assert that it is usually the precursor of the Common Whale, and that whenever it makes its appearance, this monarch of the Cetacea is at no great distance.

The head of the Beluga is small and elongated. The anterior part of the body presents the figure of a cone, the base of which may be considered to rest about the pectoral fins against that of another cone much longer, and composed of the body and tail; the muzzle is elongated and rounded in front; the jaws are equal, and furnished with nine small teeth, blunt at top, unequal and distant from each other; the longest are in front of the termination of the muzzle, where the mouth, small in proportion to the size of the animal, is situated.

The Beluga is from eighteen to twenty-one feet in length.

Above the anterior part of the head is a protuberance which is the common orifice of the two spiracles; its situation in the head causes the water rejected by the Beluga to fall behind it.

The eye is small, round, projecting, and of a bluish colour; at some distance behind it, is the meatus auditorius, but the orifice is so small as to be scarcely perceptible.

The Beluga instead of a dorsal fin has only a sort of longitudinal projection on the back, which is demi-callous, and seems to possess very little sensibility; the pectoral fins are oval, broad, and thick, and the longest of the fingers, which are all enveloped in a membrane, has five articula-

tions ; the skin, especially when the animal is young, is of a whitish colour, with a multitude of brown spots.

The Beluga subsists on pleuronectes, cod, and a variety of other fish, which it swallows with such avidity as often to run the risk of being suffocated, the orifice of its throat is so narrow : the flesh they say has a reddish tint.

The attachment of the female for the single young one to which she gives birth is very great. She retains it continually by her side, and is never separated from it without displaying the most lively uneasiness. She frequently presents it one of the mammæ which are situated near the tail, and the little one sucks the milk with avidity, which is of a dazzling whiteness.

The other species, which Rondelet has given under the name of *Mular* or *Senedetta*, the Baron conceives to be far from authenticated, and to be probably nothing but a young Beluga. We shall therefore refrain from citing any description of it.

Of the HYPEROODONTES there is but one species, to which the name of *Butskopf* has been given. The distribution and situation of the teeth of this animal have appeared to all the naturalists who have spoken of it, so decided a character, that they have agreed to express it by a single word which should be the type of an entire family. The word is composed of two Greek terms, *hyperoon* signifying palate, and *odos* tooth.

The animal in question whose jaws are equally advanced, has only two conical teeth in the lower one situated at its extremity. But the entire circumference of the upper one, and also the surface of the palate, are furnished with small, sharp, unequal teeth, of very considerable hardness. The tongue, which has much analogy with that of a young ox, is rough to the touch, indented in its entire circumference, and adherent to the lower jaw.

The common orifice of the spiracles, is a crescent whose

two points face the tail. This orifice is externally directed backwards, but the interior canals that lead to it are so inclined, that the water rejected falls in front.

The eye of this animal is situated towards the middle of the upper part of the head, and is more elevated than the commissure of the lips; the pectoral fins are placed very low between the eyes and the termination of the muzzle: they are about one-twelfth of the entire length of the animal which is about twenty-four feet, on a circumference of fifteen.

The dorsal fin is near the extremity of the tail and carried backwards; its elevation is about one-eighteenth of the total length of the animal.

The skin is brown above, whitish underneath. Some individuals have spots of a different colour from the ground; this skin covers a yellowish fat, beneath which is the flesh very red.

The tail and body form a very elongated cone in the base of which are inserted the pectoral fins.

This animal is found in the North Atlantic, and in the Arctic Icy Sea. When agitated by anger or pain, it is reported to send forth dreadful bellowings, like those of a bull in the same condition.

Of the *NARWHALS* the first species, or *Common Narwhal*, is an animal of colossal strength. It precipitates itself on everything which gives it the least offence, and furiously rushes against the most trifling obstacle. Its habitual sojourn is in the midst of the icebergs of the Polar Sea. Here in the empire of eternal frost, where darkness reigns for so great a portion of the year, this giant of the wave dares every power, braves every danger: bent upon carnage he attacks without provocation, combats without rivalry, and destroys without necessity. Its general form is ovoid; the usual length from forty-two to sixty feet; its head is big, its volume being nearly equal to one-fourth of the animal's

total length. Its upper jaw, more advanced than the under, is covered by a very thick lip, and from each side of this jaw projects an immensely long, narrow, conical tooth, and which from its base terminates insensibly in a very sharp point.

This same tooth separated from the animal, was for a long period of time preserved in the cabinets of the curious under the improper name of the horn of the unicorn. It was represented as the remains of a weapon which the ancients supposed to exist in the middle of the forehead of that fabulous animal, which they pictured as partaking of the form of the Horse and of the Stag, and whose chimerical history has been transmitted to posterity.

Even long since this opinion was dismissed as erroneous, many have believed with Albertus, that this tusk was situated in the forehead of the Narwhal. A series however, of subsequent and exact observations, have established the certainty that two tusks exist in the upper jaw of this animal, one on the right side, and the other on the left. When an individual of this species has attained its full growth, but one of these tusks remain, the correspondent one being broken by some accident.

Be this as it may, this tooth, excessively hard and pointed, and sometimes twenty feet long, must prove a most tremendous weapon, and inflict cruel and deep wounds when directed by the enraged animal at any object of his fury.

This offensive and defensive weapon is twisted spirally through its entire length, and the number of volutes from base to point is sometimes sixteen, sometimes voluting to the right, sometimes to the left. The matter of which this tooth is composed has some analogy with ivory, and is employed for the same purposes. It is hollow at its base like that of the Elephant, which it exceeds in hardness and whiteness; its fibres are finer, and not crossed one upon the other like that of the quadruped alluded to. They are

merely united, and cohere more closely, and form a whole more compact, more heavy, and less liable to injury and discoloration than the tusks of the Elephant. The diameter of this tooth measured at its base is frequently one-thirtieth of its total length. The Groënlanders make hunting darts of it, and stakes for their huts.

The aperture of the mouth in the Narwhal is remarkably small in proportion to the enormous size of the animal. The eye, tolerably remote from the commissure of the lips, forms an equilateral triangle with the end of the muzzle and the orifice of the spiracles. The back is convex and wide; the pectoral fins very short and very narrow; the two lobes which form the caudal are rounded at their extremity. Behind the spiracles is a sort of crest forming a longitudinal projection which extends from them even over the caudal fin, decreasing insensibly in elevation as it approaches this last extremity. The two spiracles unite so as to form an external orifice which is situated on the hindmost part of the summit of the head. This orifice is capable of being opened or closed at the inclination of the animal, by means of a fringed and moveable cover, as if it adhered by a hinge. The water rejected by this emunctory canal is elevated to a surprising height.

This elephant of the ocean is to be met with in the Arctic Seas, towards the eightieth degree of latitude. There he seeks his subsistence among the Mollusca, and wages cruel war on the tribe called *Planorbes*. Among fishes he particularly prefers the *Pleuronectes*. When the Narwhals assembled in troops meet a whale, they are sure to give him battle, and a bloody contest ensues, of which they are not unfrequently themselves the victims.

Some naturalists assert that it is not from any natural sentiment of hatred that the Narwhals thus attack the Whale, but merely for the pleasure of devouring his tongue, which these epicures esteem no small delicacy.

In such combats the Narwhal possesses immense advantages, both from his amazing swiftness and the power of striking his enemy without fear of retaliation. Even when his head is at a considerable distance, he can penetrate with his tusk to the very heart of the Whale. He strikes his adversary with reiterated blows; pierces him, and deprives him of life without being himself in a situation to receive the least damage.

The Narwhals would be taken with much difficulty but for one circumstance. They assemble sometimes in such immense numbers in the open creeks of the icebergs, that the manner in which they press upon each other obliges them to put their tusks upon the backs of those who precede them. This is the moment in which the intrepid mariners attack them, and destroy all that are nearest to their vessels, without giving them time to place themselves in a defensive posture.

An oil is derived from the Common Narwhal which is preferred to that of the Whale. The Groënlanders are very fond of the flesh of this animal, which they smoke-dry. The intestines they consider a most delicious morsel. Of the tendons they fabricate little cords, which are said to be extremely strong and durable.

The *Narwhal Microcephalus* is a species found in the supplement of Count Lacepède to Buffon, and which is named from the smallness of its head, in comparison to that of the Common Narwhal.

This animal is said to resemble, in figure, a long cone of greatest diameter at the belly, and then gradually diminishing in bulk towards the extremity of the tail.

From twenty-three to twenty-six feet is the total length. The tusks are sometimes as long as the entire body.

The muzzle is considerably rounded, and the head in a front view resembles a bull's. The upper jaw is a little more advanced than the under, and the aperture of the mouth is small.

The swiftness of this Narwhal from its slender form, is astonishing, and would, if its strength and bulk corresponded to its agility, render it formidable. It is found most frequently on the shores of Boston.

Another Narwhal has been supposed to exist, from the fact of some tusks having been observed at Hamburgh, by Anderson, which were perfectly smooth, without spirals or furrows.

The *Anarnack of Groënland*, (*Monodon Spurius* of Fabricus,) a species not particularly well authenticated, the Baron considers may belong to *Hyperoodon* or be not much removed. The generic characters are one or two small teeth, re-curved in the upper jaw; none below; a dorsal fin.

We now come to the CACHALOTS (PHYSETER). The first species, *Macrocephalus*, is another of these giants of the main, whose colossal structure and tyrannical dominion, render them truly formidable. This Cachalot is more lively and active than the generality of the Cetacea, and is only less bulky than the Common Whale, of which he is a most dangerous rival. Though less powerful than that first of the marine Mammalia, yet the terrible arms, the powerful and numerous teeth with which nature has provided the Cachalot, renders it a terrific adversary to all the inhabitants of the deep, even to those that are most dangerous to others, such as the Phocæ, the Balenoptera, the Dolphins, the Sharks, and Squalæ. So terrified are all these animals at the sight of the Cachalot, that they hurry to conceal themselves from him in the sand or mud, and and often, in the precipitancy of their flight, dash themselves against the rocks with such violence as to cause instantaneous death. It is not, therefore, surprising if the myriads of fishes on which this tyrant preys are struck with the most lively terror at his presence. So powerful is this feeling, that the multitudes of fish which seek with avidity the dead carcasses of the other Cetacea to devour

dare not approach the body of the Cachalot when it is floating lifeless on the surface of the water.

This redoubtable animal does not appear to have chosen any particular latitude for the scene of his tyrannical devastations. He is found in the Ocean and the Mediterranean, in the seas of Spitzbergen and Groënland, in Davis's Straits, and in the greatest part of the Northern Atlantic Ocean. It has been seen even in the British Channel, near Newfoundland, not far from the Cape of Good Hope, near the Channel of Mozambique, near Madagascar, the Isle of France, and the northern coasts of New Holland. It has also been found on the coasts of New Zealand, near Guatemala, around the Gallapagos Isles, Mocha and Chili, in the Sea of Brazil, and near Cape Finisterre.

The usual length of the *Macrocephalus* is upwards of seventy feet. The circumference in the largest part of the body is fifty-two feet three inches. Its height is sometimes more than a third of its total length.

The head of this Cachalot is one of the most voluminous known of any existing animal. It forms a gross and bulky mass, truncated in front, and almost cubic. It is more than a third of the length of the whole animal.

At the bottom of the surface of this immense cube, is the aperture of the mouth, which is long and narrow. The upper jaw is sensibly longer and wider than the under which it surrounds, it is more than eighteen feet long and about five feet wide; the lower is about fifteen feet long, and not more than a foot in width.

The number of teeth which furnish the lower jaw, only varies from twenty to thirty according to the age of the animal; they are strong, conical, and slightly curvilinear towards the interior of the throat, and externally they have the colour and hardness of ivory; their circumference in the widest part, is about three inches and a half; that portion of these teeth which is out of the gums is received

in as many alveoli which are sunk pretty deeply in the upper jaw ; a fleshy tongue of a lively red and little mobility, fills almost the entire of the bottom of the throat.

The eye which is blackish and, surrounded with very smooth hairs has but a small diameter. It is situated above the space which separates the aperture of the throat from the hairs of the pectoral fins.

The orifice of the meatus auditorius is scarcely distinguishable, though situated on a sort of excrescence of the skin which appears very plainly between the eye and the pectoral fin.

The two spiracles by which this animal ejects the water to a considerable height and with uncommon force, lead to one and the same aperture situated at the exterior extremity of the muzzle. The oblique direction of these respiratory canals causes the water to fall in front. Such is their organization, that the Macrocephali can remain longer under water than any other of the Cetacea.

The nape of the neck is marked by a slight depression which is traced from each side of the head as far as the pectoral fin. The belly is very voluminous and rounded ; the tail, not so long as the head, is conical : it is susceptible of considerable mobility. Its extremity, the diameter of which is small, is divided into two lobes, sloping and recurved one upon the other. From the end of one of these lobes to the extremity of the other there is sometimes a distance of fifteen feet.

In the last third of the length of the back is a longitudinal callosity in the form of a fin, which is abruptly terminated from the side of the tail in a perpendicular line.

The Cachalot *Macrocephalus* has a skin as soft as silk : its usual colour is blackish with green reflections, and mingled with shades of gray. Sometimes it is of a slate-blue spotted with white, and the belly is always whitish. Spring is the time of rut, when desperate combats take

place between the males, accompanied by loud and piercing cries. When once the males and females are coupled off together, they retire to the most unfrequented shores, such as the neighbourhood of the Gallapagos Isles, where they rush in crowds from the coasts of Mexico and Peru, and the Gulf of Panama. Gestation lasts from nine to ten months, and rarely more than one young animal is born; the affection of the mother for it is a model of tenderness, and she affords an astonishing example of courage in its defence.

The fat of the Cachalot is seven inches thick, and the flesh is quite red; the intestines and tendons are employed for the same purpose as those of the Narwhal. The Indians make instruments for fishing and hunting of the teeth and many of the bones. The tongue is considered a delicacy by northern nations. The oil gives a clear flame without any unpleasant smell, and with the fibres of the muscles is made an excellent isinglass; but what the Cachalots are particularly pursued for, are the *Adipocera* or spermaceti, and the ambergris.

The first of these substances is derived from the head of the Cachalot. After removing the skin, the teguments, the fat, and also a black membrane which envelops some very large nerves on the summit of this enormous head, the bony cap of the cranium is observable, which is more or less solid. Then is its cavity observed, which is divided into two wide unequal portions by a membrane tissue with nerves horizontally disposed. From these two cavities, which have been justly compared to caverns, are sometimes drawn from eighteen to twenty tons of this matter then in a liquid state.

We must observe, however, that this fluid matter is not contained directly in these two cavities: each of them is divided into several compartments by another membrane very much resembling the interior pellicle of an egg, and which contains the spermaceti. This during the life of the

animal is perfectly liquid. When entirely cooled it assumes a consistence like that of the pulp of a water melon, and when completely concrete, it is crystallized and brilliant.

Though this oily substance is found about the brain, it is very distinct from it in nature and situation ; nor is it in the head alone that it is found. It pervades the entire body, but more especially all the fatty parts. It is contained in a great number of very small vessels which terminate in a canal improperly named the spermatic vein. This canal follows the direction of the spinal marrow. Its *embouchure* is in the brain itself, where it discharges new quantities of this substance in proportion as the old is extracted.

The ambergris to which we have above alluded, is a portion of the excrements of the animal hardened by the effect of disease and mixed with undigested aliments. It is found in the intestinal canal in balls or irregular lumps, sometimes to the number of four or five.

The *Cachalot Trumbo*, (*Catodon Macrocephalus*, Linn.) has a head longer than the body; teeth straight and pointed; body and tail elongated; a rounded eminence a little beyond the origin of the tail.

This Cachalot is found in the latitudes of Groënland, &c. but particularly near the coast of New England and the Bermudas. It is upwards of seventy feet in length, but is more particularly remarkable for its enormous head which occupies more than half of this length, and is an immense reservoir of spermaceti. The jaws appear as if truncated, and produce an appearance resembling the muzzle of a monstrous bull; eighteen large teeth are in the lower jaw on each side, which are received into as many corresponding alveoli in the upper when the mouth is closed. These teeth are between seven and eight inches in length, and are as white as the finest ivory. This animal though sometimes about forty-three feet in circumference in the

widest part of the body, is yet by far the most agile, the most audacious, and most formidable of his congeners. The pectoral fins are extremely short, and the skin, which is very soft to the touch and of a blackish gray, covers a coat of fat, from which an oil is derived less rank and more clear than that of the Common Whale. This Cachalot also furnishes the spermaceti and ambergris.

Another species is the *Cachalot Svinewal*. (*Physeter Catodon*, Linn.) This cetaceous animal is easily recognised by its rounded head, small aperture of the mouth, and by having the lower jaw sensibly narrower than the upper. This alone is furnished with teeth on both sides of no great length, which correspond to an equal number of alveoli in the upper; the orifice of the spiracles at the upper end of the muzzle seems to be the same as that of the nostrils; there is a callous eminence on the back; the length of the body is from eighteen to twenty-two feet.

Another species upon which we shall not dwell, as it is doubtful, is called the Whitish Cachalot. In Gmelin's edition of Linnæus it is Var. B. of *Catodon Macrocephalus*. The Baron declares it to be the Beluga.

Count Lacepède makes a separate family of the *Physalus*, of which he reckons but one species, the *Cylindrical Cachalot* of Bonnaterre. The general characteristics are, head equal to one-third or one-half of the total length of the animal; upper jaw wide, elevated, destitute of teeth, or with very short ones completely concealed by the gum; lower jaw narrow, armed with gross conical teeth; orifice of the spiracles united, and situated on the muzzle at a small distance from its extremity. No dorsal fin.

Of the *PHYSETERS*, Lacepède reckons three species. *Mycrops*, *Orthodon*, and *Mular* or *Tursio*. The general characters are the same as *Physalus*, with the exception of a dorsal fin, and the orifice of the spiracles being situated near the termination of the upper part of the muzzle.

We shall trouble our readers with no details respecting any of these, as their authentication appears to be very insufficient, and as they seem to be confounded with some other species already noticed. But it would be great injustice to close this notice of the Cachalots generally without giving the Baron's sentiments on this subject. In the *Ossemens Fossiles*, after a compendious view of what other authors have done, the Baron proceeds thus:—

“ Having thus explained the ideas of so many celebrated men, may it not be considered as temerity on my part, to maintain that at the present day there is but one species of Cachalot really known, namely the Common Cachalot that yields the spermaceti ?

“ And yet, when justice has been done to erroneous combinations of synonymes, when the Beluga and the Grampus or Globiceps wrongly confounded with this genus have been removed, what remains but Cetacea of great magnitude with the same general characters ? Enormous head, in great part filled with spermaceti ; conical teeth more or less arched, more or less blunt, about forty or fifty, but on the reckoning of which we cannot always depend ; the back provided with a prominence of no great projection, which some call a fin-bone, a longitudinal crest, and some a tubercle, and which some like Clusius, do not pretend to have seen at all, having only observed the animal cast ashore on its back, and not finding it so easy to turn a carcass sixty or seventy feet long, and twenty feet thick. Scarcely does such an occurrence take place, but the populace rush to the spot and speedily dismember the body. Fortunate if the naturalist can find but a few bones remaining.

“ If any precise observations on this subject could be expected, it was when Camper compared the head of a Cachalot wrecked at Audierne in 1784, with one preserved in the church of Schevelingen in Holland, and which pro-

bably belonged to the Cachalot of Clusius. But this last cranium had been mutilated. The jugal bone was gone as it was also in the other, so was all the orbital part of the frontal, and a part of the occipital crest had been broken. In all the rest there was no difference."

* * * * *

"Are there Cachalots with an elevated dorsal fin? are there any with the spiracles pierced near the forehead on the middle of the head? Are there any in which the branches of the lower jaw, are not joined for most of their length in a cylindrical symphysis? All this remains to be proved, and to be proved otherwise than by figures drawn by common sailors. Not until such beings have been carefully observed by enlightened men, not until their osseous parts have been deposited in collections where they can be verified by naturalists, shall we be justified in admitting them into the catalogue of animals."

The Baron adds, that in all his researches he never met but with two fragments that could afford the slightest indication of a cachalot different from the common species, and that, even in these instances, the differences were not sufficiently important to produce any definite conclusion on the subject.

Before we proceed to the *BALÆNÆ*, we shall indulge in a few general observations on the cetaceous tribes we have thus far reviewed, with the exception of the Herbivorous Cetacea, on which we shall not dwell at present, as we have already given every important particular concerning them: the reader must have observed a strong general affinity between all the rest from the Dolphin to the Cachalot. This indeed, is so striking, that Count Lacepède has separated them all into one grand section of Cetacea, under the general name of Cachalots. But following the order of our author, we are necessitated to give our general observations on these animals after the specific details. With the Ba-

lænæ, we shall observe a different arrangement. For the sake of precision, we shall use the general term Cachalot in speaking of the others, but at the same time we beg to be understood as not using it in opposition to our author, but merely to avoid disagreeable circumlocution.

The histories transmitted to us of the Cachalots by earlier navigators, like their histories of the Balænæ, abound in absurdity and fable. Such is the necessary result of the first sentiments of terror and affright which some of the species would naturally inspire, or the consequence of that heated imagination which leads some enthusiasts to see nothing in nature but miracles and monsters.

Such recitals, however, excited the attention of men of science, and stimulated them to carry, if possible, the light of truth into a region of natural history long darkened by ignorance and falsehood. Green, Aldrovandus, Willoughby, Rondelet, Artedi, Ray, Sibbald, Linnæus, Brisson, Marten, and a crowd of other distinguished naturalists, occupied themselves with the history of these animals. Some, however, treated but of isolated species, and others too heedlessly admitted the reports of lying travellers; uncertainty, confusion, error, imperfection, and fable, still too generally prevailed.

The illustrious Count Lacepède, one of the brightest ornaments of science and of his country, and whose loss she and Europe have had so lately to deplore, was the first who introduced order into this department of Zoology. His work on the *Cetacea*, though from uncontrollable causes, not everything that can be desired, is yet by far the most perfect of anything yet offered to the world on the subject.

Some of the Cachalots, as we have seen, delight in such regions as the Northern Atlantic, the coasts of Groënland, the inhospitable shores of Spitzbergen. Some species, however, approach less elevated latitudes, while others again are found only in the happy climates of the temperate

Zones, or under the burning skies of the Equator. In general we might assert that the Cachalots frequent every sea, that like the erratic birds, they adopt no peculiar country, but advance, sojourn, or recede, according to the proportional supply of food they meet with. This is the more easily conceived, when we remember that the inhabitants of the deep can always procure an equal temperature according to the degree of their immersion in the waters.

The external form of the Cachalots, is not, as we have seen, universally the same. The general shape of their bodies is an ellipsis more or less perfect, and by no means agreeable. The form of the Common Dolphin accords most with our received notions of beauty.

The two jaws of the Cachalots differ in their relative proportions not only in the different species, but often are dissimilar in one individual to the rest of his kind. In some they are of equal length, in some the upper is longest and widest ; and in some the upper jaw is completely surrounded and cased as it were by the upper, and in others the contrary arrangement takes place.

Concerning the teeth enough has been said, and also concerning the situation, direction, &c., of the spiracles, which in the whole tribe have one common vent.

There are few of the species which are not animals of extreme ferocity. They are in general, the most cruel and dangerous inhabitants of the deep, where they reign as despotic conquerors with an empire absolute and destructive. They are not contented with repelling any attack, but dash with fury against everything which appears to resist them. They combat with intrepidity, cover the seas with blood, and pursue their prey with a bitterness and pertinacity that has scarcely any parallel in animated nature.

They are all distinguished by the extreme rapidity of their movements. They appear and disappear like lightning.

They advance and retreat with the velocity of an arrow, and the eye can with difficulty follow their varied evolutions.

In the combat, fear, fury, or pain, draw from them such profound groans, or piercing hissing cries, that their congeners are attracted in crowds from all sides, continue the fight with fresh ardour and audacity, and stain the waters with blood often to the distance of many leagues.

Notwithstanding their natural ferocity, all the Cachalots exhibit for their consimilars, an extreme attachment. They voyage together in numerous troops, in peace and mutual good understanding. The largest or strongest always leads the phalanx, and gives the signal of combat, retreat, or victory. The male and female entertain for each other a reciprocal affection, which nothing but death can alter. They both partake the sentiment of mutual affection for their young, which is a constant object of their solicitude. The mother suckles her offspring with the utmost care, teaches it to swim, and when it appears tired, carries it in her arms with much show of affection, combats with astonishing courage in its defence, and never separates from it until it can dispense with her maternal cares.

The females of almost all the species, bring forth but a single young one at a birth, and the time of gestation for all, is nine or ten months.

The food of the great majority of these animals consists in fish, such as pleuronectes, cod, &c., and also in mollusca. There are some, however, among the Cachalots that pursue seals, and some are sufficiently audacious to attack many species of the Balænæ, especially such individuals as are not adult.

The people of the north, Laplanders and Groënlanders in particular, subsist very much upon the flesh of the Cachalots which they dry in the smoke and consider an exquisite and delicate viand. They also feed upon the fat, the entrails, and the skin. The European navigators pursue

these animals for the oil, which is preferable for many purposes to that of the Common Whale. Their teeth are also an object of research, and are employed for the same purposes as those of the Elephant. It is even asserted that the ivory of many of these Cetacea, is harder, more compact, and consequently susceptible of a finer polish than what is obtained from that quadruped: the ambergris and spermaceti we have already noticed. The people of Groënland fabricate very strong cords from the tendons of the Cachalots, and also obtain small bladders from the gullet, which are said to be employed advantageously in fishing. We shall now proceed to the consideration of the *BALÆNÆ*.

As distinctive characters these animals offer to our notice whalebone instead of teeth, naked skin of different colours, mammæ, spiracles, fins instead of arms, no posterior extremities, red and warm blood, two ventricles, and two auricles to the heart, vertebræ, and lungs.

The natural history of these colossal animals is an object worthy of the utmost attention of the philosopher. It was the Whale which doubtless gave rise to the fabulous stories of hyperborean monsters, such as the Kraken, extending many thousand yards in length, like an immense bank of sand, or a reef of rocks on the surface of the water. Such exaggerations are however totally unnecessary for the purpose of exciting our wonder, for the animals in question in their own proper dimensions, are more than sufficient to impress every observer with astonishment. Those dimensions, when sufficient time has been allowed for the complete developement of the animal, are terrific. There is no doubt that whales have been seen at certain epochs, and in certain seas appear three hundred feet in length, and weighing more than three hundred thousand pounds. Among the individuals of this genus met with at the present day at a considerable distance from the Artic Pole

there are some from seventy to a hundred and twenty feet long. Some species however are considerably smaller.

The forms of the *Balænæ* also vary. Some exhibit the shape of an immense and irregular cylinder, the diameter of which is nearly equal to one-third of its length; in others the body appears like two cones pasted together at the bases. The most general form may however be considered an ellipsis more or less perfect.

The two jaws are not in all instances similarly conformed. Sometimes they are nearly of the same length, sometimes the upper exceeds the lower, and sometimes the lower the upper. Some terminate in a point, and others have their edges rounded and festooned. The aperture of the mouth is sometimes immense. Duhamel-Dumonceau relates that a common whale taken in the bay of the Somme in 1726, though but seventy feet long, had so wide a mouth that two men might enter it without stooping. In some *Rorquals* it is said to be so large that fourteen men might stand upright in its interior; and according to the report of Sibbald, a sloop with all its equipage was seen to enter the open throat of one that had been cast away on the shores of the Great Ocean.

Both jaws are completely divested of teeth, the place of which is supplied in the upper by certain laminæ, called whalebones. Each of these is composed of a kind of stiff hairs or bristles, placed side by side lengthwise. They are united, and, as it were, pasted together by a glutinous substance, which, when dried, produces on each whalebone a smooth and shining surface like scales or horn. They have almost all the properties of this latter substance.

All these whalebones, taken separately, are of an elongated form. They are curved a little in their length like a scythe: they diminish insensibly in elevation and thickness from base to point. Their edge, which is trenchant on the under side, is a little concave. It is furnished from bottom

to top with a sort of disunited bristles, forming a kind of fringe, which is more tufted and longer the more it approaches the extremity of the whalebone.

The usual colour of these corneous laminæ, is a black, marbled with shades of a less deeper hue. Sometimes, however, they are concealed under a grayish epidermis, and then appear to the eye of that colour. In the interior of the mouth of the whale is a bone extending from the end of the muzzle to the entrance of the gullet, and covered by a white and fine substance, to which the name of a gum has been given. Along this bone, on each side, the whalebones are situated with a trifling inclination from front to rear. The base of each of them enters into this gum, traverses it, and penetrates even into the jaw-bone, while the convex part of each lamina is applied against the vault of the palate, which then appears as if bristling with very hard hairs, and the length of which, in passing the lips, forms there a sort of beard, which denomination is frequently given to them.

As the palate of the Whales is oval, it is easy to conceive that the longest whalebones must be nearest its greatest diameter, and that the shortest must necessarily be situated near the entrance of the throat, and towards the end of the muzzle.

Some of these laminæ are five-and-twenty feet in length; their base, which penetrates into the gum to the depth of two or four feet, is a foot or a foot and a half in thickness, and on each side of the jaw there are three or four hundred of these laminæ.

Besides these which we have now noticed, there are other laminæ of the same description situated under the extremity of the palatal bone, but very small, and couched one upon the other, much in the same style as the scales of the body of the majority of fishes. The use to which nature appears to have destined these laminæ, is to prevent the

extremity of the jaw, which is slender and trenchant, from wounding the upper lip.

Each of these elastic laminæ is accompanied in its development, by others which are called intermediate, because they are in fact placed under the whalebones, which they separate one from the other. These laminæ being formed at the same with the others, and making but one and the same body with them, must necessarily strengthen and maintain them in their place.

All the Balænæ have not their whalebones as those of the Common Whale, to which the observations now made must be referred. Some have them not above a foot long; but in all they are equally edged with those tufted bristles, of various colours, and sometimes very long.

The tongue of the Balænæ is usually thick, fleshy, fat, soft, and spungy. It is sometimes twenty-seven feet long, and from nine to twelve feet wide. It will produce then more than six tons of oil. In some species it is covered with a slender and smooth skin, while in others it is altogether rough and bristly. Its colour is almost always white, spotted with black on the sides.

Though adherent to the lower jaw, this tongue is nevertheless susceptible of some motion. Certain species can raise, swell, and extend it to the end of the muzzle. The base of this organ in some individuals is covered with a flabby skin, extending towards the root, over the orifice of the gullet, and rendering the entrance there so narrow that fish of a moderate size cannot pass down.

The gullet of the Common Whale is much narrower than one would be led to suppose from surveying the enormous circumference of the mouth. The œsophagus, however, which is lined with a glandular and folded membrane, is nine feet in length.

The *Balæna Rostrata*, or *Pike-headed Whale*, is also said to have a narrow throat. It has also a peculiar organ,

which is a kind of large pouch or air-bladder, placed in the interior of the two branches of the lower jaw, and extending along the under part of the body. This pouch, which may be considered as a kind of swimming-bladder, the animal can inflate at pleasure with the atmospheric air received through his spiracles, and thus increase his body to a diameter of eleven feet, while, by lightening its specific gravity, he is enabled to move with double swiftness.

One of the organs of the *Balæna* most worthy of consideration is the eye. In concluding this article we shall examine the relations of its structure with the liquid element, when we shall treat more particularly of the different senses of these animals, and of those of the Common Whale especially: at present we shall just glance at the situation of this organ.

In almost all the *Balæna* the eye is equally remote from the spiracles and the extremity of the muzzle. It is situated on a sort of small convexity raised above the surface of the lips, and which permits the animal to direct this organ so as to consider an object somewhat remote, and to see it with both eyes at once. The eyes are widely separated, and placed immediately above the commissure of the lips, and consequently very near the shoulder. The crystalline is altogether conformed like that of fishes. Their eye is furnished with lids like those of other Mammalia, from which, however, they differ, in being almost immovable, in consequence of the quantity of oily fat which inflates the interior. There are also no eyelashes.

The eyes of the *Balæna* are in general very small in proportion to the enormous volume of the head and body. In the Common Whale, the largest of these animals, the diameter of the eye is scarcely the hundredth and ninety-second part of the total length of the body.

The want of external eyes is a character which the Balænæ, and all the Cetacea share in common with some of the Phocæ, and most aquatic animals.

The internal arrangement of this organ presents some interesting peculiarities, which we shall notice in speaking of the senses. The external orifice is nothing but a very narrow cartilaginous canal, proceeding from the tympanum, winding through the bed of fat as far as the surface of the skin, and opening externally by a little hole almost imperceptible, and terminated by no vestige of a conch. This canal pierces the upper maxillary bone, and terminates above the spiracle in an orifice which a small valve renders impenetrable to water.

It was believed that the Balænæ preserved after birth the oval foramen which in the mammifera is open previously to birth, and by means of which the blood can pass from one part of the heart into the other, without circulating through the lungs. This opinion however is erroneous; and it is now ascertained that the Cetacea can remain under water but a very short time, and are obliged to come frequently to the surface to respire the atmospheric air through their spiracles.

These same spiracles are two canals situated towards the middle of the great vault of the head, a little behind that part where a hump is raised on which this orifice is situated. They proceed from the bottom of the mouth, traverse obliquely and in a curved direction the interior of the head, terminating towards the middle of the upper part. They have not however the same form and situation in all the Balænæ. In some they have the form of two crescents with the convexities opposed and a little separated one from the other; in others, there are two apertures completely circular, sometimes considerably remote from each other, and sometimes so near that they seem to

form but one and the same orifice, the external diameter of which is about a hundredth of the total length of the individual.

The spiracles answer the purpose of expelling the water which penetrates into the interior of the Whale's throat, or to introduce into the larynx, and consequently into the lungs, the air that is necessary for the respiration of the animal. They send forth so considerable a volume of water, that it is sufficient instantly to fill a boat. It is also sent forth with amazing rapidity, especially when the Whale is agitated by any violent feeling, and the noise, which is tremendous to those unaccustomed to it, may be heard at a very considerable distance. It is said that those cascades are sometimes carried to a height of thirty or forty feet, and communicate a motion to the surface of the sea, which is quite perceptible at a distance of six thousand feet.

The organ by which the Whale thus expels the water through his spiracles, consists in two large membranous pouches imbedded under the skin in front of these orifices with which they communicate. Some fleshy fibres very strong, proceeding from the circumference of the cranium, unite above these pouches and compress them violently at the will of the animal. When he wants to rid himself of the superfluous quantity of water in his mouth, he swallows it, but at the same time closes the pharynx and forces the fluid to ascend into the spiracles, where he raises, by the movement he impresses on it, a fleshy valve placed in the spiracle itself towards its superior extremity below the pouches. The water then penetrates into those pouches; the valve then closes and prevents the water re-entering the mouth, and the animal compressing the pouches with violence, ejects the water to a height proportioned to the force of the compression.

The *Balænae* are truly biped animals, or to speak more

correctly, they are without feet, having but two arms with which they row, fight, and nurse the young. These two arms may be compared to the two pectoral fins of fish from which they differ however in their composition. Instead of being formed of radii connected by a membrane, they consist of bones, muscles, and tendinous flesh, and are covered by a thick skin. They have a clumsy appearance, looking like a sort of flattish sack with a pointed termination. They are more or less long, and more or less wide, according to the different species, having however in all a sufficient extent to perform the office of very strong and active oars. The insertion of their base with the body is more or less near the commissure of the lips.

Independently of the two pectoral fins, most of the Balænae have, in common with the fishes, a dorsal fin, the forms of which differ, and which is situated either at a greater or less distance from the orifice of the spiracles, or from the extremity of the tail. The Common Whale has no such thing.

The tail of the Balænae, strong, flexible, and rapid in its movements, is augmented at its extremity by a broad horizontal fin, composed of two oval lobes, which by their union produce a crescent, and each of which possesses a power of rapid and varied motion, and an independent action. These lobes are so long in some, that from the end of one to the extremity of the other, is a distance of three-sevenths of the length of the animal. This tail so powerful an auxiliary both in swimming and in combat, is the substitute of the hinder extremities of other Mammalia.

If these fins give some resemblance to Balæna with the class of fishes, and seem to remove it from the mammifera, the organs which serve for the re-production of species indicate its close affinity with the latter. The parts of generation in both sexes are strictly conformed on the mammiferous type, and in the female, on each side of the vulva, at a

small distance from the anus, is a mamma situated, with a longitudinal forked furrow, the skin of which is less hard than that which covers the rest of the body. This mamma is flattened, and not much apparent, except when the animal is giving suck. This lacteal reservoir then expands so much as to equal about the fiftieth part of the entire length of the body. The Whale's milk very much resembles that of the Cow, but contains more cream and a greater quantity of nutritive matter.

The orifice of the anus, which consists in a round or oval aperture, is situated between the parts of generation and the extremity of the tail.

The skin of the Balænae without scales, tubercles, or hairs, is very strong, though penetrated by a multitude of large pores. In certain species it is more than eight inches thick.

The epidermis is very smooth, porous, and composed of several layers. It shines because it is penetrated with a sort of oil, which in the rays of the sun makes it appear like polished metal. This oil besides diminishing the rigidity of the skin, preserves it from those injurious changes it might otherwise experience by the alternate sojourn of the animal under water, and on its surface.

The mucous tissue or *rete mucosum*, which separates the epidermis from the true skin, is thicker than in other mammifera. Its colour which is communicated to the epidermis, varies much, not only in the different species, but in individuals of the same kind, by reason of age, sex, and probably the temperature of the usual habitat. In some, it is of a pure and deep black, in others, of a black shaded with gray. Many species are half brown and half white, while the under parts of the body are of a dazzling white. Almost all the Whales of Spitzbergen are entirely white. Some Cetacea are marked irregularly with white upon a black or gray ground, but this appears to be the result of wounds which have become cicatrized.

The flesh below the epidermis and skin is reddish, coarse, hard, and dry, by no means agreeable to the taste, and impregnated with an unpleasant odour.

Between the flesh and skin is sometimes a coat of fat, more than a foot in thickness, on the head and neck. A part of this fat is so liquid, that it often forms an oil without the necessity of having recourse to the process of expression.

The quantity of blood which circulates in the Whale, is greater in proportion than that which flows in the veins of quadrupeds. The diameter of the aorta is sometimes more than thirteen inches.

The heart of the Whale is broad and flattened. This animal has a true cæcum, a very voluminous liver, a spleen of no great extent, pancreas very long, and a bladder of middling size and elongated form. The stomach of the Whale is peculiarly conformed; instead of four cavities, as in the Ruminantia, there are five very distinct and separate in the Balænæ.

When we proceed from the consideration of the softer parts of the Balænæ, to that of the osseous frame-work which sustains and consolidates them, the enormous masses presented to our view excite astonishment and admiration.

While this animal is yet young, the parietal bones adhere closely to the temporal and the occiput, so as to be soldered (as it were) together. These five bones form together a vault of a good many feet in length, with a breadth of about half as much. On opening the cranium, the interior of its base is almost level. On considering it externally, the two orbital foramina which form a communication between the cavity of the orbit of the eye and the nasal foss, are very small in the Common Whale, and covered by osseous laminae.

The two bones of the lower jaw form, by their union, a portion of a circle or ellipsis, from four and twenty to eight and twenty feet in diameter. In the gallery of anatomy in

the Museum of Paris, are three maxillary bones of this animal eight and twenty feet long.

The occiput is articulated by large condyles to the dorsal spine. The cervical vertebræ are seven in number; the first of which, the atlas, is soldered or pasted to the second the axis. The dorsal are sixty-three, and their union may be compared to an immense beam, extending forty-two or forty-six feet. The last of these next the caudal fin is nineteen inches in diameter. On each side of the dorsal spine are four ribs, each twenty-one feet in length, and eighteen and nineteen inches in circumference. The first of them is articulated to the sternum, which is wide, especially in front, but its thickness is not considerable.

The clavicles have no analogy with those of other mammifera. A shoulder blade of nine feet long is in the National Museum at Paris. The humerus is short in proportion to the size of the animal, rounded towards the summit, and marked by a small tuberosity.

The cubitus and radius are very much compressed laterally.

The carpus is composed of five bones almost hexagonal, disposed in two ranges, one of three, the other of two pieces. The bones of the metacarpus are similarly formed, soldered together, and the five digits have not the same number of phalanges.

All these bones which form the pectoral fins are so articulated that they cannot move one upon the other. There are no muscles to turn the fore-arm, and these bones are united by very long cartilages, which sometimes cover one half of the bones that they unite, and leave no suppleness to the organ which they contribute to form. All this proves that the arms of the Whale were meant as fins or oars, and not intended for the purposes of feeling, seizing, or retaining objects.

The last observation we shall make on the osseous system

is, that all the bones have a compactness and a peculiar tissue, and a kind of unctuous appearance which they owe to the oily substance with which they are penetrated while yet fresh.

We shall now make a few brief observations on the senses of these animals.

We find that in all the other mammifera, the senses of smell and taste are closely approximated in situation. In the *Balæna* on the contrary, the organ of smell is near that of hearing, and the union of these two senses serves to communicate to the animal the impression of many remote objects. This approximation of smell and hearing, prevents the acquisition of sensations equally precise with those produced by the union of smell with taste and touch, and the formation of comparisons equally certain; but it occasions more numerous, more frequent, and more varied ones. These diversified and reiterated impressions, probably increase that inclination that the *Balæna* exhibit for rapid evolutions, and may be one cause of their frequent and remote excursions.

The exquisite organs of smell, sight, and hearing in the *Balæna*, do yet exhibit proportions of extraordinary littleness in comparison with the enormous mass of the body. They even seem to be instruments only appended to the body, and forming no essential part thereof. But when we reflect that the true relations of their dimensions must be with the nature and number of the sensations they convey to the animal, to its cerebrum, and entire nervous system; when we consider that if more extended, they would not concentrate these impressions more, or at least, they would transmit them only in an isolated way; if we remember that if they were in proportion to the other parts, they would be little more than a simple organ of touch, and become comparatively useless for their peculiar purposes, we shall be forced to confess in this, as in every other instance, the wis-

dom of the arrangements of nature, and the exquisite exactitude of her adaptations.

The Whale has an organ of vision admirably conformed to the aqueous and saline element, to the thick and humid atmosphere through which it is destined to see objects. It can, moreover, as we have already observed, intercept any inconvenient quantity of light, by interposing between it and the eyes a veil, which it can render more or less opaque according to the degree of depth to which it chooses to sink below the surface of the waters. It can exercise this organ as it pleases. By elevating its head above the water, it can place it so as to extend its view over an immense plain formed by the surface of the tranquil sea, and the only limits to its power of discernment, are the smallness of objects or the curvature of the earth.

The eye of the Whale is in general conformed like that of fishes. Its crystalline is tolerably convex before and spherical behind. Its general form is maintained in a great measure, by the envelope called the sclerotica, which instead of being simply attached to the cornea by a cellulosity, most usually penetrates into the corneous substance, by long and fine ligaments. In the choroid are observable the apertures of the vessels, and also the internal membrane, called ruyshian : we can even count the radiating fibres which are disposed circularly, and surround the crystalline.

The pupil of the eye is susceptible of contraction by means of the dilatation of the iris, and of becoming a transversal elongated aperture. It is moved by four straight muscles, and by another called the suspensor muscle, which is divided into four ; there are, moreover, two oblique muscles superior and inferior.

The *Balæna* in common with the majority of aquatic animals, have no lachrymal glands. Their place is supplied by two sorts of lacunæ, situated under the upper lid, from which distils a thick and mucilaginous humour.

Every natural philosopher is aware, that the more the luminous radii fall obliquely on the surface of a diaphanous body, the more they are refracted in traversing it. He also knows, that the refraction of the rays of light is greater through a sphere, than through a flatted lens. Now the crystalline of the Whale, presents a degree of sphericity, of density, and inflammability, occasioned by the oily substance with which it is impregnated; in a word, it has such a degree of refracting force, that it compensates the defect of refraction in the water.

The Whale can hear sounds or noises comparatively feeble, at a great distance. The meatus auditorius, is very wide, and the Eustachian tube of great diameter. When the animal swims along the surface of the ocean, the ear is often eight or nine feet below the level of the water; it is, therefore, through the watery medium that the sonorous vibrations arrive at the acoustic organ. The aqueous fluid is a most excellent conductor of such vibrations, for by means of currents it transmits even the most feeble sounds to the greatest distances.

When the Whale ejects by its spiracles a quantity of water which falls around it with a tremendous noise, it can no longer distinguish other sonorous vibrations, and the whalers generally take advantage of this temporary deafness, to fall upon the animal and harpoon him more effectually.

The internal ear is composed of a labyrinth, three semicircular canals, a cochlea, a cochlearian orifice, a vestibulum, a vestibulary orifice, a tympanum, a membrana tympani, articulated osselets, placed in the tympanum from the membrane to the vestibulary orifice, a Eustachian tube, a canal, which from the membrane of the tympanum opens in a small hole externally, and is terminated by no vestige of conch.

On the first consideration of the spiracles of the Balænæ,

we should be tempted to suppose the animals totally deprived of smell, since there are neither crypta nor mucous follicles, nor projecting laminae. Neither do these organs communicate with any sinus, nor exhibit any apparatus adapted for the transmission of odorant sensations. Their interior is covered with a dry skin, of little sensibility, and capable of resisting without injury, the repeated currents of salt water with which it is deluged.

It is, however, very certain that the Whale does through this organ, or by some other means, receive the odorant corpuscles, and that even at a distance it can distinguish the degrees and qualities of odours.

A curious fact in proof of this position, is cited by Lacepède in his natural history of the Cetacea.

The Vice admiral Pleville-le-Peley, being one day at sea with his fishers, perceived some whales above the horizon. He prepared to give way to them, but the quantity of cod which was in the boat, having spread there a great quantity of stinking and putrid water, Pleville-le-Peley ordered this pestiferous water to be flung into the sea: the Whales instantly made off and disappeared. He tried this experiment several times on the approach of Whales, and invariably with the same result. From this we may conclude that these animals have a perception, even at a distance, of odorating bodies.

In speaking on this subject, we may observe that the Eustachian tube of the ear, furnishes an interior communication from the tympanum to the mouth, and then ascends towards the summit of the spiracle into the cavity of which it leads; the part of this tube which is near the ear, exhibits at its internal face, a hole tolerably large, opening into an empty space. This hollow is prolonged into different sinuses, and these sinuses and this cavity, are lined with a blackish, mucous, and tender membrane. Now the odorating emanations easily penetrating to this hollow and these

sinuses, through the orifice of the spiracle, through the aperture of the mouth, or through the Eustachian tube, we may presume that the seat of smell resides therein.

We have already seen that the arm or fin of the *Balæna*, was an organ adapted for swimming, rather than touch, seizure, or retention. How far it was capable of such operations, we have also seen. We may, however, believe that notwithstanding the thickness of the skin by which it is covered, it is yet capable of communicating by tact some sensations of the qualities of external objects; still all considerations must lead us to pre-suppose the very moderate developement of this sense in the *Balæna*.

The size, softness, and mobility of the tongue, does not permit us to doubt that the Whale possesses some delicacy in the sense of taste. The habitual humidity of this organ must render it more percipient of savours. We may, indeed, remark, that though on the score of touch and taste, the Whale has been less favoured than most of the mammifera, it is far beyond the fishes in this respect, which seem totally deprived of these two senses.

In considering an animal of this enormous bulk, we might well be led to suppose that it would require for its support a proportionate abundance of food, that it would swallow the largest fishes, and in the course of its long existence, depopulate the seas which it inhabits.

Such, however, is not the case; the whale-tribe are sustained on crabs and mollusca, most of which are very small animals, but their number compensates for their bulk. They are so numerous in the seas frequented by the Whale, that this animal has often little to do but open his mouth to take in many myriads. The most certain proof that he subsists on these alone is, the extreme leanness of the *Balæna* which are taken in the equinoctial seas, where these mollusca very rarely abound.

All the species, however, do not content themselves with

similar aliments. Some of the Balenoptera prey on fish of tolerable size, and particularly such as assemble in troops, such as mackerel, herrings, &c.

There is no certainty respecting the longevity of the Whales. We may presume, however, that individuals of the larger species might have lived more than a thousand years. We need not be surprised at the genius of allegory adopting them as the emblems of duration.

On the subject of the Whale-fishery, &c., it would be foreign to the nature of our work to enter, and even were it otherwise, the notoriety of the subject would render any remarks of ours superfluous.

As we have enlarged so much in our general remarks on the Balæna, we must avoid too minute details respecting the species.

The *Common Whale* (*Balæna Mysticetus*), to which most of the foregoing remarks apply, is otherwise remarkable for the immense power of one organ; namely, the tail. The tail of the *Mysticetus* is of the figure of a cone, the base of which is applied to the body properly so called. The muscles which move it are so vigorous, and their irritability so great, that even when great portions of them are detached from the caudal fin, it will still continue to bound, and that even when separated from the body. A longitudinal projection extends in the upper part of this tail, from the middle of its length to its extremity, which is terminated by the great fin of which we have already spoken.

In this tail resides the real power of the Whale. It is the main-spring of its swiftness, and acts as a most vigorous lever. It is with this, as with an enormous weapon, that it repels its enemies, and often destroys them. Endowed with the most extraordinary suppleness, mobility, and force, it has been sometimes known to overturn and submerge vessels of no mean burden.

If we reflect that a whale may weigh about three hun-

dred thousand pounds, that its mass is equal to that of a hundred rhinoceroses, a hundred hippopotami, or a hundred elephants, we must conceive that the shock of such a tremendous battery, coming with the rapidity of lightning, must strike like a thunderbolt. It is not surprising, therefore, that it should spread destruction around wherever the blows do not fall short of their aim.

There is an insect of the family of the Crustacea, commonly called the Whale-louse, that very much infests and annoys this immense animal. It attaches itself so strongly to the skin, that it cannot be removed without tearing it. It particularly attaches itself to the commissure of the fins, to the lips, and to the organs of generation; to the most sensible parts, and where the animal cannot so easily rid itself of the annoyance by rubbing: the bites of this insect are deep and painful.

Other insects also swarm upon the body, and multiply, particularly on the tongue, to such an extent, as almost completely to eat through it, and thus cause the death of the animal.

These insects, and Crustacea, frequently attract a number of sea-birds on the broad back of the Whale, which are partial to these importunate vermin, and hunt them there without constraint or ceremony, performing a very useful and agreeable office to the Whale, in ridding him of his troublesome guests.

Of the time necessary for the developement of the Whale we are quite ignorant; all we know is, that this developement goes on very slowly. It is now many ages since man began to pursue this enormous animal, and yet it does not appear that any taken since the first commencement of whale-fishing, have at all equalled the size of the earliest whales that were captured in the Polar Seas. The life of the Whale may last for many ages, and we shall not consider it any exaggeration to suppose that it may reach to a thou-

sand years, when we consider that a carp can live two hundred.

The Whale can inhabit every climate, but has been driven, by the avidity and persecution of man, to the bleak retreats of the Polar Regions. The species has been long diminishing, and there is every reason to believe that the period is not very remote, when this gigantic remembrancer of former worlds shall exist only in the memories and the histories of men; when its colossal remains shall attract the admiration of another age, as those of the Mastodontes and Megatheria, the Ichthyosauri and Plesiosauri do of ours. Change, diminution, decay, and dissolution of parts, are perpetual in the universe, and nature is permanent only as a whole.

We have nothing to add of any interest to our author's account of the *Nord-Caper*, or the BALÆNOPTERA; nor shall we trouble our readers in this place with an enumeration of species that can yet scarcely be considered as sufficiently authenticated. We shall therefore conclude this notice on the Balænae as we did that of the Cachalots, by giving the Baron's sentiments respecting the discrimination of species.

"The Balænae, in the modern acceptation of the word, *i. e.*, Cetacea with the palate furnished with whalebone, are divided into three sub-genera: *The Whales Proper* which have no dorsal fin, or fold under the throat; the *Fin Fish* or *Gibbans* which have a dorsal fin, but are without the fold; and the *Rorquals*, the throat of which is channelled with folds or longitudinal furrows. This division we see is based on very precise characters; but the case is far otherwise in the species reckoned in each of these sub-genera. In fact we shall find that even the existence of the second sub-genus is hardly sufficiently authenticated.

"The most celebrated of the *Whales Proper*, is the Great Whale of the Northern Seas, which formerly used to come

as far as the Gulf of Gascony, where the Basques were in the habit of pursuing it, but is now confined to the coasts of Groënland, Iceland, and Spitzbergen. It will hardly be credited that for more than a century there was but a single figure in the least degree authentic of an animal, the pursuit of which occupied so many men. It is true, however, that the figures engraved in almost all books before that of M. Scoresby, are copied from Frederic Martens's published in 1671, with some slight alterations made by the designers for the purposes of concealing the plagiarism.

"The enormous thickness of the body represented in Martens' figure, we have known from that of Scoresby to have been much exaggerated, and this, added to some obscure expressions of Martens, led some writers to doubt the species.

"This author says that the Whales taken near the North Cape are not so gross in bulk as those of Spitzbergen, and yield less fat. He adds that they are more dangerous. He designates these Whales in German by the adjective *Nord-Caper* (*Nord-Caper Wall-fisch*), Whale of the North Cape. This was considered a sufficient ground for the formation of a new species designated by the noun substantive *Nord-Caper*. This word was even supposed to signify *Pirate of the North*, because the word *Caper*, taken substantively and derived from a different root, has that meaning in German.

"Another equivocal expression of Zorgdrager a Dutch author, was attended with similar consequences. He speaks of fishes of the ice (*Ys-fisch*, in German *Eis-fisch*), by which expression he simply means such Whales as are taken near or in the midst of the icebergs, and which exhibit some difference of bulk or habits. He distinguishes even those that are taken in the southern ice between Spitzbergen and Nova Zembla, and those belonging to the

west between Spitzbergen and Davis's Straits. This from superficial reading induced Klein to establish his *Balanæ Glacialis* which he divides into *Australis* and *Occidentalis*, and adds the *Nord-Caper* as a variety under the name *Borealis*, the habitat of which is in reality more southern than that of *Australis*. This name *Nord-Caper* has also been since indistinctly used for many of the larger Cetacea, supposed to be slenderer than the Common Whale.

“As to the *Nord-Caper*, the only document of any authenticity concerning it, consisted in the figures done in Groënland by Backstrom, and sent by Sir Joseph Banks to Lacedæpède. They certainly appeared different from those of the Common Whale, as long as these last were taken only from that of Martens above mentioned; but since the recent and exact figure of Captain Scoresby, it is evident, on comparison, that he and Backstrom represented but one and the same species. This is affirmed by Scoresby himself, who has braved with the most distinguished courage and perseverance those dreary climates where the Whale fishery is carried on, and since the year 1820 has personally contributed to the taking of three hundred and twenty individuals. He declares that the old drawing of Martens, represents nothing in nature, and that there is no foundation for the species of the *Nord-Caper*.

“The case of the *Gibbar* or *Fin-fisch* is not precisely similar to the last. It has been described and represented by Martens as a distinct species. But when we reflect on the one hand, that it is his figure which has been copied in all books of natural history, none having been given even by Captain Scoresby, and on the other, that Martens has not spoken of the *Rorqual*, or Whale with folded throat, called also *Fin-fisch*, we may be led to suspect some confusion.

“This animal would appear to be as long or longer than the Common Whale, much more slender, with a more

pointed muzzle, and a vertical fin on the back, from which its name is derived. But all these characters are attributed to the large Rorquals, and the only one which distinguishes the Gibbar, is that Martens has said nothing of the folds under the throat.

“Egedius’s *Fin-fisch* is only a bad figure of a *Rorqual*, and Anderson’s that of a Common Whalé, a little slender, to which a fin has been added.

“Peter Camper gives a head of a skeleton of the Gibbar preserved in the Museum of Bremen; but the painting of the animal found in the Weser is also preserved there, and M. Albers assures us that it represents a true *Rorqual*.

“The name of Jubarta given to one of these *Balænoptera* or *Rorquals* seems to be only a corruption of the name Gibbar. A more ludicrous corruption has given rise to the name of Jupiter’s fish, used by some northern whalers.

“The name of *Rorqual* means in Norwegian, *whale with furrows*, and indicates the folds which characterize the throat and part of the belly of this sub-genus of the *Balænae*.

“Nomenclators admit three species in the North, and have been justified by what we find in some travellers. But an attentive examination of the figure, and descriptions on which these rest, does not enable us to establish any distinctive characters. All these animals have the head horizontally flattened, the skeleton differently formed from that of the Common Whale, the lower jaw a little longer than the upper, the skin of the breast and throat furred with a great number of longitudinal folds, and capable of dilatation. The whalebones short, hard, and filing off into large and brittle threads. A fin in the rear of the body, short and thick, and resembling a boss. When we examine the testimonies concerning these three pretended species, we find no one who has seen more than one, and each author is obliged to refer to the evidence of strangers. Thus Linnæus who names two, *Boops* and *Musculus*, affixes to the latter the sign that he

has not seen it. Fabricius who describes *Boops* very well, speaks only on hearsay touching *Musculus*, and seems to think it the Nord-caper. His *Rostrata* which he characterizes only by its extreme littleness, may be only the young of *Boops*. Ascanius who has figured one very well, asks if it may not be *Musculus*, without saying why it should not be *Boops*. The same observation applies to Captain Scoresby, who talks of three species, but has only seen and represented one, and confesses that the figures given by naturalists are very embarrassing.

“As for the third species, the Pike-headed Whale of Pennant which some French writers call *Baleine à museau pointu*, it is according to Pennant, Shaw, and all the English who have described it, nothing but *Boops* itself. Sibbald first called it *piked whale*, on account of the dorsal fin, and it has been confounded with the *Balæna Rostrata* of some writers which is the *Hyperoodon*; besides, this denomination of pike-head would apply to the entire sub-genus.

“There remains, then, but one distinction applicable to those *balænae* with folded throat, that is, diversity of size. Mr. Scoresby gives to *Boops* forty-six feet in length; Fabricius fifty-four. *Musculus* should be much larger, and even exceed the Common Whale in size. It would be, according to Scoresby, sixty-six, and even eighty feet in length, and much more according to Olafsen and Powelsen. The *Rostrata* would be, in its smallest dimensions, seventeen, twenty, or twenty-five feet. But who, considering that these remarks are founded on individuals beheld singly, at great distances of time and place, and by divers observers, shall hazard the assertion that such differences are not the result of age?

“However, if it should be proved that but one Rorqual exists in the Northern Seas, it may still be possible that other seas may contain different species.

“Were we to trust to the list of citations given by nomen-

clators, we might suppose that a considerable number of writers had observed and described *Balænæ* with bosses, one or two on the back instead of a fin. We find, however, that the beings called in catalogues *Balæna Gibbosa*, and *Balæna Nodosa*, rest only on a few equivocal lines of Dudley's, in the *Philosophical Transactions*. It is impossible, from what is there said, to say that the first is not a Rorqual. We also know how easily the Cetacea lose, by accident, all or parts of their dorsal fin; we can well conceive that those species, of which no naturalist has spoken since, may depend only on individual alterations.

“We have seen how incomplete and confined are yet the notions we have on the various *Balænæ*. I am far, however, from pretending that their species are reducible to the number I have here characterized. These animals have been too little observed, to allow us to believe that they have been all described. We know not if the Whales of the Pacific are the same as those of the Atlantic. Lacepède, after drawings made in Japan, has described several, which, if the figures be correct, are probably distinct species. All I could wish by this exposition of my doubts, is to prevent naturalists from assuming as definitions what are really not so, and registering imaginary species in systems of nature as if they really existed, and to prevent navigators from supposing that their endeavours are no longer wanting to the furtherance of this branch of science.”

